NATIONAL CONFERENCE

ON

"GLOBAL SCIENCE FOR GLOBAL WELLBEING"

CHASCON 2023

(CHANDIGARH SCIENCE CONGRESS)

12th to 14th, OCTOBER , 2023

ABSTRACT BOOK

SOUVENIR OF CHASCON 2023

CHIEF PATRON

Prof. Renu Vig

Vice Chancellor, Panjab University, Chandigarh

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- Ms. Sunita Goyle, Director NIELIT, Ropar
- Dr. Virinder Singh, Advisor to Chancellor Desh Bhagat University, Mandi, Gobindgarh

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ABOUT CHASCON 2023

The Chandigarh Science Congress (CHASCON) is an academic event, organised every year since 2007 by Panjab University in collaboration with the Chandigarh Region Innovation and Knowledge Cluster (CRIKC). Stated to be held this year from October 12-14, 2023, 16th CHASCON has acquired a national character and will be attended by academicians and researchers from all over the country. Focusing on the theme "Global Science for Global Wellbeing" the Congress hopes to take forward the deliberations of the National Science Day, 2023 and manifest the spirit of Vasudhaiva Kutumbakam (the world is one family), the essence of Indian philosophy and the theme of G20 Indian Presidency.

Spread over a period of three days, CHASCON -2023 brings together an eclectic academic feast designed to cater to researchers across a wide array of disciplines, specialisations and age groups. The event will include plenary lectures, panel discussions, oral and poster presentations and exhibition aimed at steering scientific development towards human wellbeing by fostering closer linkages and interdisciplinary interactions among academia, industry and policy makers.

The event hopes to inspire the young minds towards scientific thinking and provide them a platform for sharing their vision through scientific presentations and exhibits. We welcome you all to partake in this academic repast!!!

ABOUT PANJAB UNIVERSITY

One of the oldest universities in India, Panjab University was setup at Lahore in 1882. It has a long tradition of pursuing excellence in teaching and research in science and technology, humanities, social sciences, performing arts and sports. By virtue of its history and academic excellence, the University has acquired international stature. Over the years, the University has emerged as an institution at the pinnacle of innovative teaching, research and community outreach.

Hon'ble Vice President of India, Shri Jagdeep Dhankhar is the Chancellor of Panjab University. Professor Renu Vig is the first woman Vice Chancellor of the University. Panjab University Campus at Chandigarh has seventy-three teaching and research departments/institutes/centres besides four independent Chairs for research. Furthermore, the

University has 189 affiliated/constituent colleges, spread over Punjab and Chandigarh besides Regional Centres at Muktsar, Ludhiana, Hoshiarpur and Kauni.

The University is an active partner in various prestigious International High Energy Research Programmes at Fermilab (USA), KEK (Japan) and CERN (Switzerland). The University has MoUs with University of Nottingham (UK), University of Birmingham (UK), Nottingham Trent University (UK) and University of Western Sydney (Australia). The university also has collaborations with National Science Technology and Development Agency, Thailand; University of Missouri, USA and Universidade de Aveiro, Portugal; International Crops Research Institute for Semi-Arid Tropics (ICRISAT), Hyderabad; International Centre for Agricultural Research in Dry Areas (ICARDA), Morocco for a joint collaborative project funded by the Consultative group on International Agricultural Research (CGIAR) consortium, funded by organisations such as UNDP and FAO; International Centre for Agricultural Research in Dry Areas (ICARDA), Morocco; World Vegetable Research Centre, Taiwan through its South Asia Centre at Hyderabad and Baylor Medical centre, Dallas, U.S.A. The University also has collaborations with a number of national institutes like IARI, Delhi; GB Pant University of Agriculture and Technology, Pantnagar; HFRI, Shimla; IIT, Roorkee; PGIMER, Chandigarh; IMTECH, Chandigarh; CSIO, Chandigarh and many others.

In addition, the University has established Pre-Incubation Centres and Skill Development Centres under the Rashtriya Uchchatar Shiksha Abhiyan of the Government of India to give impetus to research and innovation. BioNEST-PU was launched by BIRAC with a vision that focused on fostering the Biotech Innovation Ecosystem and nurture young entrepreneurs in the northern region of the country. DST-funded Tech Enabling Centre at Panjab University has the vision to make this region fountainhead of technological solutions for needs of society and industry. University DST-Centre for Policy Research has the mandate to prepare guidelines for strengthening Industry-Academia Collaborations under Public Private Partnership mode.

Panjab University has a rich legacy to be proud of. It has produced illustrious alumni in all walks of life. It has been the alma mater of ex-President of India, Dr Shankar Dayal Sharma, former Prime Ministers Shri I K Gujral and Dr Manmohan Singh and a large number of Business tycoons, Nobel laureates, scientists, sports-persons, renowned public figures, notable bureaucrats and theatre personalities who have contributed immensely to the cause of the nation building.

ABOUT CHANDIGARH REGION INNOVATION AND KNOWLEDGE CLUSTER (CRIKC)

Chandigarh Region Innovation and Knowledge Cluster (CRIKC) was initiated at Panjab University in 2013, where institutions in Chandigarh region agreed for the creation of a Knowledge Cluster whose mandate is to use Science, Technology and Innovation for Socio-Economic development in the region. The regional impact can then be transformed to national and global goals to align with the UN SDGs (Sustainable Development Goals).

By creating a shared ecosystem and acting as a regional solution provider, an environment of national and global competition could be fostered amongst all stakeholders i.e. academia, industry, society, individuals and the government. Presently under the banner of CRIKC, various verticals are being run to foster and sustain close academic alliances between the diverse institutions of higher education and research to facilitate innovation and knowledge creation and achieve excellence in all academic spheres without compromising the autonomy of the participating institution. Faculty and scientists are encouraged to carry out joint and collaborative research and to run joint teaching/training programs at all levels of education & research. This encourages pooling of research facilities of the participating institutions, promoting and sustaining excellence in research and policy planning for better comprehension of GoI programmes and catering to societal needs.

CRIKC domains actively contributing to the society and scientific community are CRIKC Ignited Minds being run at various government schools. This programme infuses scientific temper at school level for children and science teachers. CRIKC Shodh Samwad being organized at various institutes is a platform for fostering collaboration amongst PhD scholars and encouraging budding research scholars at national and international level to take up the mantle and responsibilities from their mentors. Industrial collaboration and innovation is being propelled by establishing an Advance Drone Tech Centre at Panjab University campus. CHASCON which started as a regional event has now become a national conference to increase its outreach and allow interaction with eminent scientists of national and international stature.

CHASCON 2023 COMMITTEES

Team	Members
Advisory Committee	• Prof. Rumina Sethi, Dean of University Instruction • Prof. Harsh Nayyar, Director, Research and Development Cell • Prof. Y.P. Verma, Registrar • CA Vikram Nayyar, Finance and Development Officer • Prof. Sanjay Kaushik, Dean College Development Council • Prof. Jatinder Grover, Dean Student Welfare • Prof. Simrit Kahlon, Dean Students Welfare (Women) • Prof. Navdeep Goyal, Dean Science Faculty • Prof. Akhtar Mahmood, Dean Medical Sciences • Prof. Keshav Malhotra, Dean, Business and Management Sciences • Prof. Amritpal Toor, Dean Engineering and Technology • Prof. Poonam Piplani, Dean Pharmaceutical Sciences • Prof. Neeru Malik, Dean Design and Fine Arts • Prof. Rajeev Kumar Puri, Coordinator, RUSA • Prof. Rajat Sandhir, Fellow, Panjab University • Prof. D.D. Singh, Chairperson, Biotechnology and CHASCON-2022 Coordinator • Dr. Namita Gupta, Director, Public Relations
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STUDENT VOLUNTEERS

- Siddharh
- Mandeep Kaur
- Mohini Thakur
- Anju Antil
- Reecha Sharma
- Rishu
- Muskan
- Anandita
- Vipasha
- Priya

National Conference on "Global Science for Global Wellbeing"
CHANDIGARH SCIENCE CONGRESS
OCTOBER 12-14, 2023

Day 1 - October 12, 2023 Venue: Law Auditorium, Panjab University, Chandigarh	
08.00 - 09.15	**Registration**
09.30 - 11.00	**Inaugural Session** 09.30 - Welcome 09.40 - Panjab University Anthem 09.45 - Lamp lighting and Sarasvati Vandana 09.55 - About CHASCON - Professor Neena Capalash, Coordinator, CHASCON-2023 10.00 – Presidential Address by Professor Renu Vig, Vice Chancellor, Panjab University, Chandigarh 10.10 - Address by Professor Bruce Alberts, University of California, Former Editor-in-Chief, Science (Online) **Why Science Education is More Important than Most Scientists Think** 10.25 – Release of Souvenir 10.30 - Keynote address –Professor Balram Bhargava, President, NASI and Former DG, ICMR, New Delhi **India's Fight Against Covid -19** 11.10 - Remarks by Professor Vivek Lal, Director, PGIMER, Chandigarh - Guest of Honour 11.15 - Felicitations 11.25 - Vote of thanks – Professor Ajay Mittal, Co-Coordinator, CHASCON-2023 11.30 - National Anthem
11.30	**Inauguration of EXPO-CHASCON 2023** Venue: Law Auditorium Grounds
11.30 – 12.00	Tea Break & Networking
Frontiers of Indian Science: Session –I **Chair - Dr Girish Sahni, Former DG, CSIR and Former Director, IMTECH, Chandigarh**	
12.00 – 12.30	Plenary Lecture 1 - Professor Annapurni Subramaniam, Director, Indian Institute of Astrophysics, Bengaluru **Why, How and What of Chandrayaan-3 and Aditya-L1?**
12.30 - 13.00	Lecture by Dr. Yogesh Chawla, Former Director PGIMER, Chandigarh **Menace of Fatty Liver**
13.00 - 13.30	Plenary Lecture 2 – Professor Vilas Tonapi, Director, Indian Institute of Millet Research, Hyderabad **Mainstreaming Sustainable livelihoods and Healthy Living with Climate Resilient Millets**
13.30 -14.30	Lunch Break & Networking
Venue: Law Auditorium, Panjab University, Chandigarh	
Frontiers of Indian Science: Session-II	
14.30 – 15.00	Lecture 1- Professor Neeraj Dilbagi, Department of Bio and Nano Technology, GJU, Hisar **Nano-Platforms for Sustainable Agriculture and Healthcare Applications**
15.00 – 15.30	Lecture 2 – Dr. Samrat Ghosh, Assistant Professor, Material Chemistry and Chemical Sciences, IISER, Mohali **Glimpses of Peter F. Drucker's Concept of Innovation & US Navy's Design Philosophy (K-I-S-S) in My Frugal Endeavours for Societal Benefit**
15.30 – 15.40	**Merck High-End Skill Development Centre. CSIR-IMTECH, Chandigarh**

15.40 – 16.10	Tea Break & Networking
16.10 – 16.40	Lecture 3 -Dr. Jatinder Arora, Executive Director, PSCST, Chandigarh **National and Sub-national Planning to address Climate Change for Global Wellbeing**
18.00 -19.00	**Cultural Programme at Law Auditorium**
Day 2 - October 13, 2023 **Venue: Respective Sections of CHASCON -2023** **(Details for sectional activities are available on CHASCON website)**	
09.30 – 10.30	Scientific Session
10.30 – 11.00	Tea Break & Networking
11.00 – 13.00	Oral Presentations
13.00 – 14.00	Lunch Break & Networking
14.00 – 15.30	Poster Presentations
15.30 – 16.00	Tea Break & Networking
16.00 – 17.00	Poster Presentations
Day 3 - October 14, 2023 **Venue: Law Auditorium, Panjab University, Chandigarh**	
09.30 – 10.30	**Session-III** **CHASCON – CRIKC SHODH SAMVAD PRESENTATIONS**
10.30 – 11.00	Tea Break & Networking
11.00 – 13.00	**Session-IV** **Innovator Ki Kahani Star-up Success Story - Interactive Session** **Panelists:** **1. Dr. Dipan Sahu,** Asst. Innovations Director, Innovation Cell, Ministry of Education & AICTE, Govt. of India **2. Mr. Vineet Khurana**, Chief Executive Officer, Startup Accelerator, Chamber of Commerce, India **3. Dr. Sudesh Kumar Yadav**, Director, CSIR Institute of Himalayan Bioresource Technology, Palampur **4. Dr. Ashutosh Pastor**, Senior Manager and Head-Incubation FITT, IIT, New Delhi **5. Dr. Jagadis Gupta**, Founder & Non-Executive Director, Fruvetech Pvt. Ltd. Scientist and BIG BIRAC Innovator, NIPGR, New Delhi **6. Dr. Ranjana Bhandari**, Director, AKB Innovant Healthcare Pvt. Ltd. **7. Mr. Abhishek R. Dhaliwal**, Director, This life matters Pvt. Ltd.
13.00 – 13.30	Valedictory Function
13.30 – 14.30	Lunch

Messages

Professor Renu Vig
Vice - Chancellor

PANJAB UNIVERSITY
CHANDIGARH, *India* 160 014

VICE-CHANCELLOR'S MESSAGE

I am pleased to share that Chandigarh Science Congress, 2023 is being organized by Panjab University from October 12 – 14, 2023, at the time when the whole country is euphoric about the successful soft landing of Chandrayan – 3 and the successful launch of Aditya L1 and globally highly acclaimed G-20 presidency. CHASCON is organized in collaboration with the Chandigarh Region Innovation and Knowledge Cluster (CRIKC) since 2007. This year the 16th CHASCON is being organized as a National conference to extend its outreach. This conference has come a long way to provide a platform for scientific deliberations that I believe are quintessential to ignite young minds.

This year's deliberations on the theme "Global Science for Global Wellbeing" are very relevant in the light of global role played by India during the Covid-19 pandemic when the challenges were transformed to opportunities which laid the foundation of Atmanirbhar Bharat capable of addressing global healthcare requirements. The Congress is a move to carry forward the National Science Day 2023 discussions and make Vasudhaiva Kutumbkam (the world is one family), the cornerstone of Indian philosophy, a reality and contribute to the G-20 resolves of the country.

The event, featuring plenary talks by eminent speakers, panel discussions in sync with the National Start-up Culture and Start-up enablers on board, will provide meaningful deliberations. I believe the introduction of Shodh Samwad competition this year will be motivating for the young innovators. Through oral and poster presentations, research scholars will share their scientific achievement on CHASCON platform and gain from the inputs of experts in the field. I am sure CHASCON 2023 will be an enriching experience for scientists, faculty, scholars and students and will culminate in collaborations for future scientific endeavors.

My best wishes to the organizers for the success of CHASCON-2023.

(Renu Vig)

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PANJAB UNIVERSITY

OFFICE OF THE DEAN OF UNIVERSITY INSTRUCTION

Professor Rumina Sethi
Dean of University Instruction

SECTOR-14
CHANDIGARH-160014

Message

Global science is for global wellbeing, constantly buttressing our sense of confidence and undying curiosity to unravel the enthralling mysteries of nature that surround us. The stimulus to human urge to make trailblazing discoveries with the astonishing strides made in technological advancement are all owing to the incredible sense of freedom and undying curiosity for which credit goes to the creation of an environment conducive to research and learning. At this annual conclave of Chascon, the pursuit of science would receive a nudge if we were to ensure that young minds going into research do not in any way get bogged down by the professional constraints imposed on them. Widespread dissatisfaction and apprehensions arising among scientists apparently results from the smothering of their imaginative instincts.

I think what I have in mind is the long history of scientific research and knowledge over the centuries made with the deep-seated sense of intellectual freedom. This freedom was largely bestowed on the young minds by the full responsibility of the state policy, which sadly now seems to be getting wrecked by the rise of private agencies that expediently narrow down research relevant only to their pecuniary interests. Individual forays and serendipitous discoveries into unknown territories therefore have gradually receded. Science, for the greater good of humanity, must never lose sight of its focus at the cost of original research. Global science must stimulate a culture that will ensure that all scientific knowledge and discoveries become the property of humanity at large. Beware, therefore, of surrendering your intellectual labour for immediate gains. If we are tempted to make this mistake we will do it at the cost of our freedom, our critical thinking, and most of all, our ingenuity. We are productive not on the basis of the papers we publish, but on the quality of imagination that we nurture and bring to our research.

My warm wishes for the success of the Chandigarh Science Congress 2023.

Rumina Sethi

Rumina Sethi

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Director
Research & Development Cell

PANJAB UNIVERSITY
CHANDIGARH
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Message

I am pleased to write about CHASCON-2023, an annual event that highlights the research and development efforts of Panjab University and its surrounding region. The university has a long history of promoting science and technology in the area. CHASCON started in 2007, and it has evolved over the years to adapt to changing needs.

In 2013, the Chandigarh Region Innovation and Knowledge Cluster (CRIKC) was established, which brought together various research institutions in the region to strengthen CHASCON. We appreciate the support from these institutions and hope for their continued involvement.

CHASCON-2023 aligns with the national goal of promoting scientific research for the betterment of humanity. It is inclusive in terms of themes, issues, content, and participation. The event provides a platform for young researchers to showcase their work and interact with experts in their fields.

I'm pleased to announce that CHASCON-2023 is a national event with 979 registrations and 545 abstracts from undergraduate, postgraduate, and PhD scholars. I want to express my gratitude to our Worthy Vice Chancellor, Professor Renu Vig, for her support in organizing this event and appreciate the hard work of the organizing team

(Professor Harsh Nayyar)

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DEPARTMENT OF PHYSICS
PANJAB UNIVERSITY, CHANDIGARH – 160014 (INDIA)

MESSAGE

This year the Chandigarh Science Congress (CHASCON) 2023, is being organized as a National Conference at Panjab University on the theme '*Global Science for Global Wellbeing*'. The very theme suggests collaboration of scientists across the globe for sustainable solutions to major challenges faced by humanity. This National event which has been envisaged to be a confluence of academic deliberations, plenary talks by eminent scientists, panel discussions on Start-ups in India, oral and poster presentations, will be an enriching experience for the participants. Expo -CHASCON 2023 will provide a platform for showcasing the latest technologies and high-end products and services. Shodh-Samwad competition is a motivating addition to the event to attract young innovators. The conference will bring diverse scientific groups together with a common vision that is the global wellbeing and will help foster collaborations among academia, scientists and industry.

As India celebrates the G20 Indian Presidency, it is a matter of honour for Panjab University to host a national event which is in tune with the spirit of Vasudhaiva Kutumbakam (whole world is one family) and that provides a platform to engage various stakeholders to work together for a better world.

I wish CHASCON 2023 a great success.

(Prof. Navdeep Goyal)
Dean Faculty of Science

स्नातकोत्तर चिकित्सा शिक्षा एवं
अनुसंधान संस्थान,
चण्डीगढ 160 012 (भारत)
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सत्यमेव जयते

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Prof. (Dr.) Vivek Lal
MD (Med), DM (Neuro)
Director
&
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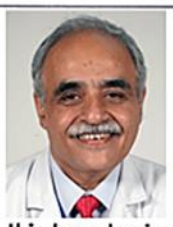

MESSAGE

It is heartening to be a part of the Chandigarh Science Congress (CHASCON) being organized by the Panjab University, Chandigarh in collaboration with the Chandigarh Region Innovation and Knowledge Cluster (CRIKC). The theme "Global Science for Global Wellbeing" is well suited in current scenario and has to be supported by knowledge of global issues. This kind of platform disseminates knowledge to people in simplified representations from all over the world.

As I reflect upon the complexities of various diseases, there is tremendous progress that we have made to create a healthier and safer world for us all. In spite of our significant achievements, we must be constantly attentive in our pursuit to develop a globally secure health system. I am confident that by working together we will come out stronger as a nation and a people.

The significance of collaborative and integrative science in a dependable and understandable way is of utmost importance to develop healthcare regimens.

I wish you success in endeavours to a productive culmination of congress on a theme of national importance.

21/9/23

(Prof Vivek Lal)

राष्ट्रीय तकनीकी शिक्षक प्रशिक्षण एवं अनुसंधान संस्थान
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प्रो. (डॉ) भोला राम गुर्जर
निदेशक
Prof. (Dr.) Bhola Ram Gurjar
Director

MESSAGE

It is a matter of great pleasure to welcome all the participants, delegates, panelists and dignitaries of National Conference on Global Science for Global Wellbeing which is being organised by Panjab University, Chandigarh from 12th to 14th October 2023. This prestigious event is expected to bring several ignited minds from different parts of the country to present their scientific and technological advancements for the growth of the nation. This conference will provide a vibrant place for scholarly discussions on Global Science while manifesting the essence of Indian philosophy and the theme of the G20 Indian Presidency.

The presentations, exhibitions, seminars, and workshops to be organised during this event will help us to spread awareness about the latest developments in the field of science that could further improve global well-being through various innovations. Global science is expected to ensure healthy and longer lives while providing innovative ways to deal with diseases. This event will help in raising awareness about environmental factors while providing highlights to more reliable and sustainable solutions to save the planet. The active interaction and collaboration among scholars will also encompass a multidisciplinary approach for understanding and solving emerging health challenges irrespective of the economic, cultural, social, and environmental factors. My best wishes to all the stakeholders!

(Prof Bhola Ram Gurjar)
Director

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Director

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On behalf of the IISER Mohali fraternity, I am pleased and privileged to share best wishes for the academic event- the Chandigarh Science Congress (CHASCON) -2023, supported by the Chandigarh knowledge cluster CRIKC. CHASCON is one of the finest examples of pluralistic research networking among educational institutions of Chandigarh region. We are delighted to be an active participant and beneficiary of this program. Recently, we have successfully conducted many theme-centric programs, such as the CRIKC Chemistry Symposium (2019) and CRIKC Biology Symposium (2016), connecting many institutions in the cluster and bringing together groups of researchers under one umbrella. The work of CRIKC is praiseworthy, as it showcases the latest scientific and technological developments and defines and solves problems for the betterment of society. CHASCON is one of these initiatives, and I wish it all the success for the event to bring the best scientific temper and fruitful collaboration within the knowledge cluster.

Sincerely

Prof. J. Gowrishankar
Director IISER Mohali

Dr. Jatinder Kaur Arora
Executive Director
Punjab State Council for Science & Technology

Message

It is indeed heartening that CHASCON-2023 is being organized by Punjab University to bring together stakeholders to delve upon the theme 'Global Science for Global Well Being' which resonates well with this year's theme for National Science Day celebrated across the country.

The scientific and technological advancements are offering immense possibilities for food security, ensuring healthier lives, combating climate change, generating energy from renewable resources, faster communication etc. India is playing predominant role to bring Science Technology & Innovation at the forefront for solving the above pressing global challenges which were deliberated at length during G-20 Summit held under the Indian presidency.

Punjab State Council for Science & Technology, the think-tank of Department of Science Technology & Environment, Government of Punjab is working in tandem with national vision to strengthen STI ecosystem at the sub-national level by undertaking initiatives for promoting translational research, cleaner production, growth of tech led startups & grassroot innovators, offering solutions to address grand challenges of the State and unmet needs of industry as well as mainstreaming climate agenda across developmental planning.

I hope that CHASCON-2023 will provide platform to researchers, academicians, industry and startups for knowledge exchange to further the technological developments for global well being.

(Dr. Jatinder Kaur Arora)
Executive Director
Punjab State Council for Science & Technology

Prof. Baldev Setia
Director
Punjab Engineering College (Deemed to be University),
Chandigarh

Dear CRIKC Institutions, Scientists & CHASCON participants,

The role of science in safeguarding global well-being in today's VUCA (volatility, uncertainty, complexity, and ambiguity) world is critical. From the unprecedented challenge posed by the global pandemic three years back to the pressing issues of climate change, access to clean water, sustainable energy, and more, science stands as our beacon of hope and progress.

Today, the need of the hour calls upon the global scientific community to unite under the banner of "Global Science for Global Wellbeing" to harness the power of knowledge, innovation, and collaborations to address the world's most pressing challenges. Together, we can pave the way for a brighter, healthier future for all.

As we embark on this journey, Punjab Engineering College (Deemed to be University), Chandigarh wishes to contribute to this meaningful journey in a way that extends beyond the traditional academic bounds. It is committed to foray into unchartered areas to shape the world as a healthier, more equitable, and more prosperous planet for future generations.

We commit ourselves to the cause of "Global Science for Global Wellbeing." Together, we have the power to drive positive change on an unprecedented scale. Our shared dedication to science can lead us to a brighter, more resilient, and healthier world.

Punjab Engineering College (PEC) stands firm in this resolve and wishes the organizers and participants of CHASCON 2023 the very best of discussions and deliberations.

Prof. Baldev Setia
Director
Punjab Engineering College (Deemed to be University),
Chandigarh

Abstracts of Invited Talks

WHY SCIENCE EDUCATION IS MORE IMPORTANT THAN MOST SCIENTISTS THINK

Prof. BRUCE ALBERTS
Former Editor-In-Chief of Science,
University of California,
San Francisco (UCSF),
United States of America

ABSTRACT

The knowledge and the problem-solving skills of scientists are critical for every nation – no matter how rich or poor. In addition, every society needs the values of science: honesty, generosity, and an insistence on evidence while respecting all ideas and opinions regardless of their source of origin. These values – promoted as a "scientific temper" by India's Jawaharlal Nehru -- are critical for the success of any democratic form of government. But to spread such values, "science education" will need to be redefined at all levels, becoming a central part of the curriculum with more emphasis on spreading scientific habits of mind, and less emphasis on learning science facts.

Scientifically based research, both on how students learn and on science education, has been critical for changing our views of how best to teach science at all levels, from kindergarten through college. Significant progress has been made, with research supporting active science learning through student inquiry in small groups, as opposed to the rote memorization of science facts. But a more rapid change from traditional teaching is needed, including a strong focus on improving the introductory college courses that are taught by scientists.

Prof. BALRAM BHARGAVA
Padma Shri Awardee
President, National Academy of Sciences, India
Prof. of Cardiology, AIIMS
& Former Director General, ICMR

BRIEF PROFILE

Dr. Balram Bhargava is an Indian physician scientist, cardiologist, medical educationist, and innovator. He is a Professor of Cardiology at the All-India Institute of Medical Sciences, New Delhi. He is Ex-Director General at the Indian Council of Medical Research, New Delhi and secretary of the Department of Health Research; a division under Ministry of Health of Family Welfare, Government of India. He serves as the Executive Director for Stanford India Biodesign Centre, School of International Biodesign (SiB) and also initiated the Indian chapter of *Stanford Biodesign* at IIT Delhi under the supervision of then Department of Biotechnology secretary, Maharaj Kishan Bhan. The organization had set goals to promote innovators of medical technology through fellowships and also to conduct internships and events related to the area. He is an extensively published scientist with more than 300 articles in peer reviewed journals and editor-in-chief of the British Medical Journal Innovations and of the Indian Journal of Medical Research. In recent years he has been at the forefront of managing several public health crises in India including covid-19 and brought Indian research in shaping contemporary global practice through vaccine development and describing role of plasma therapy. He has been the recipient of Padma Shri, the fourth highest civilian award, for his contributions to the field of medicine. Along with that he has received many national and international awards.

WHY, HOW AND WHAT OF CHANDRAYAAN-3 AND ADITYA-L1

Dr. ANNAPURNI SUBRAMANIAM
Director,
Indian Institute of Astrophysics,
Bengaluru

ABSTRACT

The landscape of space exploration went through a dramatic change in the last two months. India pole-vaulted to the front seat in space exploration, with the successful soft-landing on the southern polar region of the Moon. The precision and the economics with which the mission was executed resulted in attracting the attention of not only the nation but also the world. Before we could take a breath and digest this stupendous feat, ISRO launched its next ambitious mission – the Aditya-L1 mission, the first dedicated mission to study the Sun. For the first time, the Indian space mission is flying to the Sun-Earth L1 Lagrange point, which is about 1.5 million Km away. In this talk, I shall address the purpose, methods and the expected science outcomes from these missions.

NANO-PLATFORMS FOR SUSTAINABLE AGRICULTURE AND HEALTHCARE APPLICATIONS

Dr. NEERAJ DILBAGHI
Professor,
Department of Bio and Nano Technology,
GJ University of Science and Technology,
Hisar, Haryana

ABSTRACT

Nanotechnology is gaining highest attention amongst researcher community due to its widespread applications in various fields like medicine, catalysis, agriculture, energy and materials. Innovative technologies are now a days focused on healthcare as well as agriculture and have provided high-quality, on-time, acceptable, and affordable instrumentation techniques. Nanotechnology have provided a new generation of nanostructures with unique properties and astonishing applications. From the beginning nanotechnology is continuously affecting agriculture and healthcare, thus have contributed to better outcomes. We have performed the development of nanoformulations of carvacrol, thymol, naringin to improve its poor water solubility and preservation of encapsulated active components against the environmental condition. Further the antimicrobial potential of thymol nanoemulsion, carvacrol nanoemulsion and naringin loaded neem oil nanoemulsion as a sustainable biopesticide have been explored to control the bacterial blight of cluster bean. In another research work we have performed synthesis and characterization of novel highly fluorescent MOF/QD composites followed by modification of substrate with phosphate-specific adsorbents and immobilization of MOF/QD composites. This modified substrate was utilized for detection of phosphate in spiked samples using the developed optically active composites. In addition, we also report the development of two efficient, low-cost, rapid, portable detection method for better and timely detection of trypanosomosis in equines and hence help in reducing deaths and saving livestock. The assay time was very less as compared to other diagnostic methods without losing sensitivity as well as specificity in comparison to ELISA. In tissue engineering, nanocomposite of silver doped magnesium oxide have been coated on stainless steel and this well characterized coated stainless steel have been evaluated for its orthopaedic applications. The synthesis of polymeric nanoformulation of some polyphenolic compounds A and B using a targeted agent/linker have also been carried out for effective treatment of cancer. The as synthesized nanoformulation have shown significant anticancer activity against MCF-7 cancer cell lines and tumour cell lines. The nanoformulation have also shown nutraceutical property as well. Similarly in another research work, bacterially synthesized metallic nanoparticles have been loaded into plant gum based nanogel. These nanogels have been utilized to prepare bandages which have shown excellent antimicrobial activity against various multidrug resistant pathogenic bacteria. The wound healing activity was evaluated using wound scratch assay on fibroblast cells.

NATIONAL AND SUB-NATIONAL PLANNING TO ADDRESS CLIMATE CHANGE FOR GLOBAL WELL BEING

Dr. JATINDER KAUR ARORA
Executive Director,
Punjab State Council for Science and Technology (PSCST),
Chandigarh

ABSTRACT

Climate change is a global threat with local impacts. It is affecting every sector including Water, agriculture, ecosystems, biodiversity, infrastructure, health and overall wellbeing. The Intergovernmental Panel on Climate Change (IPCC) has reaffirmed the effect of anthropogenic greenhouse gas emissions on climate change and emphasized on ambitious and timely actions to curtail the consequences. Thus, India has proactively set up its Nationally Determined Contributions (NDCs) goals and developed National Action Plan on Climate Change (NAPCC) to advance ecological sustainability of its development path.

Therefore, for effective Sub-national Planning, the State of Punjab has assessed the observed trends of climate parameters based on 70 years historic IMD data (1950-2020) and future projected climate trends for different Representative Concentration Pathways (RCP 4.5 and 8.5) scenarios based on CORDEX South Asia Model. The District Level Climate Change Vulnerability Assessment has also been carried out based on state-specific 15 indicators using uniform National Framework & Methodology.

Further, based on assessment of sectoral needs, State Action Plan on Climate Change (SAPCC 2.0) has been developed to prioritize the actions in line with NDCs goals and SDG targets. SAPCC 2.0 outlines 43 adaptation and 20 mitigation strategies under seven missions i.e. Forest, Ecosystem and Biodiversity; Sustainable Agriculture; Water; Health; Strategic Knowledge; Enhanced Energy Efficiency & Solar Energy and Sustainable Habitat.

The priority accorded for climate action at National & Sub-National level, has led to mainstreaming of climate agenda across the developmental planning for enhancing the resilience and wellbeing of our communities.

GLIMPSES OF PETER F. DRUCKER'S CONCEPT OF INNOVATION & US NAVY'S DESIGN PHILOSOPHY (K-I-S-S) IN MY FRUGAL ENDEAVOURS FOR SOCIETAL BENEFIT

Dr. SAMRAT GHOSH
Assistant Professor,
Material Chemistry, Chemical Sciences
IISER, Mohali

ABSTRACT

Most successful Grassroots Level Innovations for Societal Benefit have at least three aspects. One aspect is the view of Peter. F. Drucker (a well-known management guru), who regards innovation is not always science & technology based but something which has potential to create or serves as a catalyst for a positive change in social environment, behaviour of the people.

The second aspect is the United States Navy's 1960s design mantra "Keep It Simple Stupid" (K-I-S-S) which emphasizes simple ideas over complex intricate ideas for ruggedness, reliable performance, easy, quick operation, troubleshooting & maintenance by crew on board.

The third aspect is the frugality and sustainability. In my talk, I will highlight an inspiring example from 1970s, where an Indian Innovation is regarded globally as quintessential of highly successful Grassroots Level Innovation for Societal Benefit.

In the remaining talk, I will share some of my frugal endeavours I have embarked upon which incorporates my improvised US Navy Design Mantra (Keep It Simple & Sasta) and which in near future is likely to change social behaviour as defined by Peter. F. Drucker.

Keeping in mind, the theme of this year's event "Global Science For Global Well-being", I will speak on some of the Grassroots Level Innovations for Societal Benefit from our laboratory like:

Vayujal: Harvesting Water from Air

Agninirvaan: A Fire-extinguisher for Kids, Ladies, Elderly, and Wheelchair bound with no prior fire-fighting experience

NeelGagan: A Super-Green, Smoke-free, Sonic Animals & Bird Repeller for Farmers & Airports

Pavitra: A frugal air cleanser based on a simple anti-pathogen mechanism

MENANCE OF FATTY LIVER IN INDIA

Prof. Y. K. CHAWLA
Former Director PGIMER, Chandigarh

ABSTRACT

Fatty liver diseases, encompassing alcoholic fatty liver disease (AFLD) and Non-alcoholic fatty liver disease (NAFLD) is a major cause of chronic liver disease globally and in India. It is indeed a growing health concern in India, with approximately 38% of total population having fatty liver, primarily NAFLD. The already high burden of NAFLD in India is expected to further increase in the future in parallel with the ongoing epidemics of obesity and type 2 diabetes mellitus. Several other factors that contribute to menace of fatty liver disease in Indian population are lifestyle changes due to COVID-19 pandemic, genetic predisposition, urbanisation, alcohol consumption and limited awareness. Fatty liver disease, also known as hepatic steatosis, occurs when there is an abnormal accumulation of triglycerides in hepatocytes. It is a heterogenous condition and may progress to advanced stages including cirrhosis and hepatocellular carcinoma. Central to NAFLD pathogenesis is insulin resistance, which disrupts glucose homeostasis and triggers cascade of mechanisms in the hepatocytes. The lipid overload due to increased lipid uptake and de novo lipogenesis leads to oxidative stress, unleashing inflammatory response which further leads to cellular stress. Genetic predispositions, environmental factors, and gut dysbiosis interplay with the pathogenesis of NAFLD. These intricate components contribute to the disease's complexity, rendering NAFLD a dynamic condition. As the patients are often asymptomatic, it is crucial to identify the risk factors of the disease. To mitigate the menace of this increasingly prevalent disorder, India requires a multifaceted approach, including public awareness campaigns, lifestyle interventions to promote healthier diets and increased physical activity, early screening and diagnosis, improved access to healthcare services. Further research is needed to elucidate the intricate molecular mechanisms underpinning NAFLD, facilitating the development of targeted therapeutic approaches.

MAINSTREAMING SUSTAINABLE LIVELIHOODS AND HEALTHY LIVING WITH CLIMATE RESILIENT MILLETS

Dr. VILAS A TONAPI
Director,
Indian Institute of Millets Research,
Hyderabad, Telangana

ABSTRACT

Millets are among the staple food crops that are grown in diverse agro-ecological zones of India, particularly suited for drylands and hilly areas under rainfed agriculture, are climate resilient, hardy and dryland crops also termed as nutricereals which contribute substantially for food and nutritional security. Millet crops cultivated in India include Jowar or sorghum (Sorghum bicolor), Bajra or pearl millet (*Pennisetum typhoides*), Mandua/Ragi or Finger millet (*Eleusine coracana*), and small millets comprising of - Kangni or Foxtail millet (*Setaria italica*), Kutki or Sama or Little millet (*Panicum miliare*), Kodro/Kodo millet (*Paspalum scrobiculatum*), Jhangora or Sawan or Barnyard millet (*Echinochloa frumentacea*), Cheena or Proso millet (*Panicum miliaceum*), and Korale or Browntop millet (*Brachiaria ramosum*). Other minor millets grown elsewhere are Teff (*Eragrostis tef (Zucc.) Trotter)* and Fonio (*Digitaria exilis Staph and Digitaria iburua*) and Job's tears (*Coix lachryma-jobi*). In fact, climate Resilient Millets are grown in 131 countries and are traditional food for 760 million people in Asia & Africa. Earliest evidence of millet cultivation in India dates back to Indus valley civilization around 3000 BC. These millets are traditional staple cereals which are most hardy, resilient and climate adaptable crops for harsh, hot and dry environments. They are expected to yield better than their counterparts such as rice and wheat and may form an important source of food security besides, nutritional security they are known for. Millets are diverse and are adapted to different climatic conditions and cropping systems, providing a strong case to enrich biodiversity as well as to diversify the food grain basket for global food and Nutrition security in the climate change scenario.

Millet crops are mainly grown in tropical, sub-tropical and slightly temperate regions of the world, with Asia and Africa accounting for major production and consumption centres. These crops also originated in either of these continents and domesticated in other continents as well. Sorghum and Proso millet (common millet) are most widespread being cultivated in 112 and 35 countries respectively during 2019 (FAOSTAT database, http://www.fao.org/faostat/en/). Global production of millet crops is about 91.48 million tonnes from 74.15 million hectares. Sorghum and pearl millet comprise more than 90% of the area and production. The rest of the production includes finger millet, proso millet, foxtail millet and other non-segregated millets. Until now national agricultural policies have tended to focus on increasing production and, in general, not addressed negative externalities on nutritional health, natural capital, and the

protection of biodiversity. Though there has been rapid growth in agriculture with its focus on food production, more than 820 million people in the world today are still hungry, underscoring the immense challenge of achieving the ‘Zero Hunger 'as targeted under SDG 2030. Millets have potential health benefits and epidemiological studies have showed that consumption of millets reduces Obesity, hypertension, diabetes, risk of heart disease, protects from diabetes, improves digestive system, lowers the risk of cancer, detoxifies the body, increases immunity in respiratory health, increases energy levels and improves muscular and neural systems and are protective against several degenerative diseases. The high fibre present in millets plays a major role in cholesterol lowering eliminating LDL from the system and increasing the effects of HDL.

A targeted focus on increasing the demand for millets is key to reviving their production and supply. The need is to promote millet consumption in both urban and rural areas, especially among the most food vulnerable communities. This effort has to be complimented by creating awareness among urban consumers on the benefits of millets consumption. A balanced rural-urban approach will change to minimize disparities in value creation opportunities and simultaneously re-position millets as the ‘nutri-cereal of choice’. There is lot of scope for value-addition and processing to earn more than the routine business. It can be promoted through entrepreneurship development in collective action mode through SHGs and FPOs. These apart, policy support for farm-gate processing, buy-back assurance; implementation MSP for all millets, their inclusion in MDM and PDS system will boost-up the economy of millets farmers in this region. Building the linkages between the captive markets such as publicly funded programs and the start-ups/processors will result in a solid supply-demand chain. Further, the start-ups to be linked with the backward linkages such as FPOs or SHGs for creating solid Supply chain linkages, while the big players can concentrate on penetrating the nutrient-rich products into domestic and export markets to create a sustainable millet ecosystem for future to usher in Food and Nutrition security in the climate change scenario.

MILLETS (SHREE ANNA): GOOD FOR YOU, GOOD FOR THE PLANET & GOOD FOR THE FARMER

NANOMATERIALS-BASED BIOINSPIRED PLATFORMS FOR HEALTHCARE APPLICATIONS

Dr. SANDEEP KUMAR
Professor
Department of Physics,
Punjab Engineering College
(Deemed to be University),
Chandigarh 160012, India.

ABSTRACT

Nanoscale science and technology offers numerous opportunities for diverse fields through the development of new materials with improved performance via bottom-up or top-down approaches. Nanotechnology has led to major breakthroughs in many fields including materials science, biology, medicine, environment, energy and artificial intelligence. In particular, nanomaterials with higher surface area to volume ratio offer enhanced reactivity and better effectiveness than their bulk counterparts. The physical properties of nanomaterials (such as size, porosity, morphology, and composition) can be tuned intentionally for specific application. Innovations in bio-conjugation chemistry and bioengineering have made it possible to develop nanomaterials-based bioinspired platforms. Many biological systems demand a particular lock-and-key approach for molecular interaction of nanoparticles; on the other side, surface engineering offers an alternative approach to create specificity of biofunctionalizednanomaterials. At present, nanomaterials-based bioinspired platforms have an important role in wide range of applications including detection of contaminants (like heavy metals, antibiotics, pesticides etc.) in water/beverages as well as their removal along with development of safe formulations of agrochemicals at nanoscale. These advanced platforms are potentially more efficient, stable, and selective than a single nanoplatform. For instance, the functionalization of nanomaterials with target-specific biomolecules can help to enhance the efficiency, sensitivity, and selectivity of the system. While designing any nanomaterials-based bioplatform, it is important to remember that the materials used for environment and healthcare applications should not be another pollutant themselves after their use. This consideration not only increase the confidence of consumer but also enhances the acceptance of a particular technology.

STEM CELLS: FUTURE OF MEDICINE?

Dr. ARUNA
Department of Stem Cells,
PGIMER, Chandigarh,

ABSTRACT

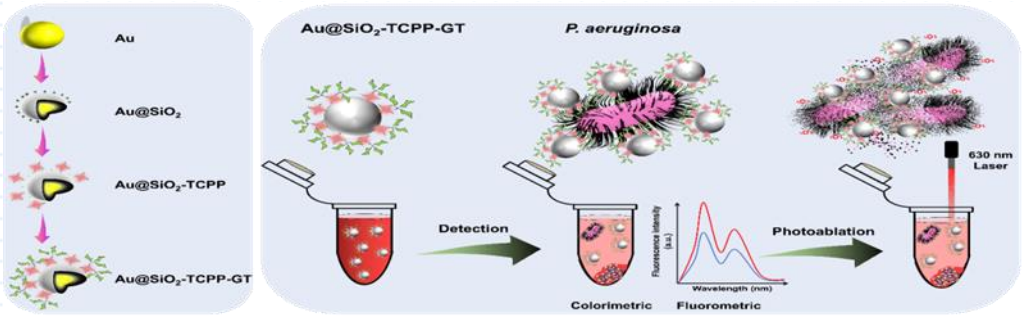
Stem cells have emerged as a revolutionary frontier in medical science, holding immense promise for the future of healthcare. This abstract explores the potential of stem cells to transform medicine, delving into their unique properties, diverse applications, and ethical considerations. Stem cells, with their capacity for self-renewal and differentiation into various cell types, offer groundbreaking opportunities for regenerative therapies, disease modelling, drug development, and personalized medicine. However, the field also faces ethical dilemmas, regulatory challenges, and the need for continued research to unlock their full potential. This talk provides a glimpse into the evolving landscape of stem cell research and its profound implications for the future of healthcare.

A MULTIEPITOPE GLYCAN-BASED FLUORESCENT NANOCOMPOSITE WITH DUAL FUNCTIONALITY FOR SENSING AND ABLATING PSEUDOMONAS AERUGINOSA

Dr. NITIN KUMAR SINGHAL
National Agri-Food Biotechnology Institute (NABI),
Sector-81, S.A.S. Nagar, Mohali,
Punjab, India

ABSTRACT

Early, precise Pseudomonas aeruginosa diagnosis is vital due to health risks. Current bacterial detection faces biosensor non-specific binding issues. We created a galactose tripod (GT) as a P. aeruginosa-specific ligand for the first time using chemical synthesis. We coupled GT to an Au@SiO 2 -TCPP fluorescent nanocomposite, which is photothermally active. Au@SiO_2 -TCPP-GT can be used to identify P. aeruginosa, and synergistic photothermal and photodynamic therapy can also be used to ablate the bacteria. Galactose monopod (GM) and GT had better binding energies with P. aeruginosa lectin (binding energy = -6.6 kcal/mol and -5.9 kcal/mol, respectively), according to simulation and molecular dynamics investigations. Additionally, a binding investigation was expanded to include the bacteria P. aeruginosa, which contains a receptor with a galactose-binding carbohydrate recognition domain. The colorimetric assay verified the 10^4 CFU/mL limit of detection (LOD). Additionally, we investigated the ability of Au@SiO_2 -TCPP-GT to photo-ablate bacteria by causing the creation of singlet oxygen in the media when driven by laser light (630 nm). The cytotoxicity experiments on mammalian cell lines were used to confirm the cytocompatibility of the Au@SiO 2 -TCPP-GT. The Au@SiO 2-TCPP-GT further shown non-hemolytic action. Synthesized glycan nanocomposites treat P. aeruginosa wounds; also detect/eliminate in contaminated food/water.



Scheme 1. Schematic representation of glycan nanocomposite synthesis and its application in detection and photoablation of *P. aeruginosa*.

PAVING THE WAY IN THE ERA OF PRECISION MEDICINE

Dr. JAYA SHUKLA
UICC Fellow,
Additional Professor,
Department of Nuclear Medicine & PET,
PGIMER, Chandigarh

ABSTRACT

Precision medicine is a personalized and targeted approach to screen, diagnose and treat disease. It is different to one-size-fits-all approach. Several diagnostic and therapeutic molecules have been already used in the management of various diseases. This could be explained with few examples. Neuroendocrine tumors (NET) are been diagnosed noninvasively using radiolabelled octreotide and same molecule is used for the treatment of metastatic NET by just replacing diagnostic radionuclide with therapeutic one. Similarly sever wide spread diseases like prostate and bone cancers are now been treated.

The passive immunotherapy has been widely prescribed as targeted therapeutic drugs (trastuzumab, rituximab etc). The precision medicine with radiolabelled monoclonal antibodies could be exploited to deliver targeted therapeutic radiation to tumors expressing respective receptors. Several protein and nonprotein molecules are currently been studied.

Besides, metastatic diseases, primary tumours are also been targeted to help in precision surgical and targeted therapy. Few of these are also part of my research. For example, radiolabelled microspheres are used for trans-arterial delivery of therapeutic radiation to primary liver cancer. The long-term exposure to inappropriately excessive production of cortisol from adrenal glands leads to Cushing's syndrome (CS). It is crucial to identify the lesion non-invasively within the pituitary, a master but tiny gland, or outside pituitary. This helps in precise surgical removal of culprit lesion and preserve healthy pituitary. Tamoxifen (tam) is another FDA approved drug for ER+ breast cancer patients. Radiolabelled tam may serve as a diagnostic and therapeutic tool for ER+ cancers. This approach may be expanded to many areas of health and healthcare.

INDIRECT EVIDENCE GENERATION USING NETWORK ANALYSIS IN DRUG SAFETY

Dr. DIPIKA BANSAL
Associate Professor,
Clinical Research Unit,
Department of Pharmacy Practice,
NIPER, SAS Nagar, Punjab.

ABSTRACT

The benefit/risk relationship is evaluated throughout the entire drug life cycle. Before market authorization is granted, clinical trials are conducted to assess its efficacy and safety in a particular therapeutic indication. These studies are able to detect the most frequent adverse events due to the limited variety of conditions; referring to the narrow patient selection criteria and sample size along with the short duration of clinical trials. However, rare or long-latency adverse events are extensively detected after a drug hits the market. This makes it challenging to attain all the required safety data when relying exclusively on clinical studies. Post-marketing surveillance gives more realistic results as they occur in a more natural setting and afford evidence to safeguard or enhance the safety of approved drugs. Pharmacovigilance deals with pro-active risk management to minimize any potential risk associated with the use of medicines, and is essential during the post-marketing phase, even for medicinal products which have been on the market for a number of years. The trends indicating a rapid increase in the number of potential ADRs, medication errors, and errors resulting in patient harm over the time period necessitate a thorough investigation of patient safety outcomes. Network meta-analysis has been considered a potentially pertinent approach for evaluating safety outcomes associated with pharmacological interventions.

Network meta-analysis (NMA) is a technique for comparing three or more interventions simultaneously in a single analysis which exploits all available direct and indirect evidence across a network of studies. NMA tend to concentrate on the therapeutic efficacy parameters, but this strategy allows for a thorough assessment of potential risk profiles as well. Focusing solely on efficacy in the absence of a risk and safety assessment fails to provide a comprehensive overview of the pharmacological interventions. NMA is a dynamic approach for comparing the risk and benefits associated with the drugs which extend the evaluation of multiple treatments utilising a value tree as a visual, hierarchical depiction of key benefits and risks. Direct and indirect evidence can be generated based on treatment-emergent adverse events (TEAEs) as well. Furthermore, the surface under the cumulative ranking curve (SUCRA) could be employed to rank the treatments for each outcome.

ROAD TO TRANSLATIONAL RESEARCH

Dr. TULIKA GUPTA
Associate Professor,
Department of Anatomy,
PGIMER, Chandigarh.

ABSTRACT

Translational research acts as a bridge between basic researchand clinical care, connecting their findings to each other. It applies discoveries made in dissection hall or lab to the clinical practice. Basic research leads to new principles and new concepts, upon which practical clinical applications can be built upon. Research which can provide answers related to the disease pathophysiology or management protocols needs promotion. Multidisciplinary approach is required to orient thebasic research towards improvement in the patient care. Development and realisation of translational research strategies should be facilitated on departmental and institutional level. Barriers in translational research needs to be identified and addressed. So that brilliant minds of young researchers can be trained,in identifying gaps in the existing knowledge and towards research with specific clinical goals, resulting into positive impact on human health.

PROMOTING RESILIENCE AMONG THE YOUTH

Dr. PRAHBHJOT MALHI
Consultant (Child Psychology), Fortis Medcentre,
Former Professor, Department of Pediatrics,
Post Graduate Institute of Medical Education and Research, Chandigarh.

ABSTRACT

Evidence indicates that there is a global decline in the subjective wellbeing among the youth. Unfortunately, there is also a concomitant increase in mental health problems and unhealthy behaviors including consumption of substances, sedentary life style, and lack of exercise. Given that the adolescent years are critical as they have a long-lasting impact on the physical, psychological, and cognitive well-being, it is essential that the concerned stakeholders promote positive mental health and behaviors that help the youth to thrive and flourish. There is a need to develop competencies, values, internal, and external assets such as developing relationships and support systems as well as internal assets such as personal skills and commitment to good choices, taking responsibility for their lives and developing an independent identity. Developing, sustaining, and widening the personal and community circle of connections help to expand the social safety net of the youth. Teaching youth to resist the negative peer influences and developing positive keystone habits are important coping strategies that adolescents need to learn to navigate the travails of youthful years. The present talk will shed light on the above and help the students to understand the importance of developing prosocial behaviors, emotional regulation skills, and self-esteem for overall subjective wellbeing among youth.

Evolution of Artificial Intelligence and Data Science in Engineering

Dr. POONAM SAINI
Associate Professor in Computer Science and Engineering,
Punjab Engineering College,
(Deemed to be university)
Chandigarh

ABSTRACT

By 2030, Artificial Intelligence (AI) could contribute up to $15.7 trillion to the global economy, according to PwC's Global Artificial Intelligence Study 2023. The talk on Artificial Intelligence and Data Engineering will elaborate on the evolution of AI to Generative AI and highlight a few techniques of AI engineering wherein the tools, systems, and processes are developed to enable AI to be applied in the real world. However, prior to building intelligent products, we need to gather and prepare the data that fuels AI algorithms and helps them to learn and perform better. Data Engineering promotes an engineering approach in order to analyse big "imperfect" data by creating and using new smart algorithms. The talk will focus on both paradigms, emphasizing application examples from different engineering domains.

Communicating Science-The Steps Before

Dr. AMOD GUPTA
Emeritus Professor,
Post Graduate Institute of Medical Education and Research,
Chandigarh

ABSTRACT

The lecture discusses the importance of effective communication in science and emphasizes the need for curiosity and questioning in the pursuit of scientific research. It highlights the historical significance of scientists from various fields and their contributions to the world of science. The text also points out the role of organizations like the Royal Society of London in promoting scientific principles such as peer review and reproducibility.

The author encourages aspiring scientists to focus on showcasing their observations and interpretations in a way that can change the world rather than seeking awards or applause. He mentions the challenges faced by Indian scientists, including poor documentation and communication practices, and the need for a shift in the mindset to encourage curiosity and questioning among students.

In conclusion, the lecture emphasizes the importance of curiosity and asking unasked questions in the field of science and calls for a change in the approach to science education to foster future innovators in the field.

Dr. VANEET JISHTU
ICFRE-Himalayan Forest Research Institute,
Shimla,
HP, India

ABSTRACT

This presentation addresses the floral diversity of higher plants in the trans Himalayan cold desert of North Western India. It mainly encompasses the area of Ladakh - Union Territory, Lahaul & Spiti and parts of Kinnaur in Himachal Pradesh, and the northern tip of Uttarakhand. This cold desert is among the least explored, remote and harsh ecosystem in the Indian Himalaya Region (IHR) with a much-fragmented database. Among the many biological hotspots across the IHR, the Indian trans-Himalaya features among the most ecologically fragile biogeographic zones in India. It is known for its sparse but rare vegetation that includes numerous endemics and threatened medicinal plants. Thus, aim is to apprise the audience about this unique biodiversity rich ecosystem in a challenging terrain, providing a brief introduction to its physical features, habitation, livelihood and culture, biodiversity, phytogeography, besides brief on the history of botanical studies in the region. The major focus however, would be to highlight the floral diversity of the Ladakh, with special emphasis on plant adaptions, distribution pattern, medicinal and aromatic plants and its rich traditional knowledge of *Sowa-Rigpa*, highlighting the importance of dominant families like Asteraceae and Fabaceae. The flora plays an important role in providing fodder and fuelwood, a lifeline in the region. However, today the economic development and fast rising tourist pressure is impacting the native vegetation. With this in mind, the emerging threats to this high-altitude cold desert flora is also discussed, based on my field observations and experience of almost three decades.

Keywords: trans Himalaya, cold desert, flora, biodiversity, traditional knowledge, phytogeography

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ABSTRACT

Cancer as a disease is called as "Emperor of all Maladies". It is given this formidable name due to its similarities with an enemy king who can attack, injure and severely damage anyone. In the current century, due to multiple environmental factors, a large number of cancer cases are being diagnosed in a relatively younger age group. This has emerged as a big challenge in front of medical fraternity. There is a sense of urgency to create more awareness among general public about various preventive steps to reduce development of new cancer cases. Simultaneously, early signs and symptoms of various cancers need to be informed to people in-order to detect a malignant tumor in an early stage. Most cancers, when detected early, have a high chance of cure. Rapid advancements in the filed of medicine has led to tremendous growth in treatment options for various cancers in the last decade. At present the main modalities to treat cancer are as follows: 1. Surgery: its main goal is to remove tumor from the site of origin. Surgery is most effective when the tumor is small and localized 2. Medical Oncology: encompasses use of medicines, chemotherapy, modern targeted therapy, gene directed therapy and monoclonal antibodies. Its main roles are to reduce size of a tumor to make it resectable, to reduce chances of recurrence of cancer in future. This form of therapy can be very useful in advance cases where the tumor has spread to multiple organs 3. Radiotherapy: encompasses use of modern radiation techniques to eliminate tumors with the help of various types of radioactive rays. It is a very effective form of therapy when a tumor is localized. It can be used even in those cases where surgery is not possible With right awareness among general population, with making cancer treatment accessible and affordable, and with encouraging healthy lifestyle, one day we shall emerge victorious over this "Emperor of all maladies".

MAINSTREAMING SUSTAINABLE LIVELIHOODS AND HEALTHY LIVING WITH CLIMATE RESILIENT MILLETS

Prof. Dr. U. C. BANERJEE, FIIChE, FIEI, FSESc, FBRSI
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ABSTRACT

Chirality represents an indispensable concept in various industries including pharmaceutical, agricultural, and fine chemicals. A molecule possessing a chiral center may exist in an enantiomerically pure form or as a mixture of enantiomers. Despite their similar chemical structure, the enantiomers can exhibit completely opposite metabolic, toxicological, and pharmacological profiles. Thus, the differences exhibited in pharmacokinetic and pharmacodynamic activities by opposite enantiomers (eutomer and distomer) of the single compound are often significant. Initially chiral drugs were synthesized using various chiral reagents and the processes were not green. However, with the biochemical catalysts the process of making chirally pure drugs are simpler. Among the various enzymes used for biocatalytic reactions, lipases, nitrilase, nitrile hydratase, epoxide hydrolase and oxidoreductases have been found to have tremendous applications. Nitrilase is an important class of hydrolases that convert nitriles to the corresponding carboxylic acids and ammonia. The (*S*)-selective microorganisms were tried for the bio-reduction of complex heteroaryl ketone. Oxido-reductases were used to enantioselective reduction of a number of prochiral aryl ketones like acetophenone, acetonaphthone, acetyl pyridine, acetyl thiophene and N, N-dimethyl-3-keto-3- (2-thienyl)-1-propanamine to synthesize Duloxetine, a block buster drug. It is worth mentioning that more than half of the pharmaceuticals currently marketed are chiral and 20 out of 35 recently approved pharmaceuticals by the US Food and Drug Administration (USFDA) are chiral. However, 88% among the chiral pharmaceuticals are still administered as racemates.To this end, USFDA also recommends the assessments of pharmacological activities exerted by each enantiomer and promotes the development of enantiopure pharmaceuticals. The problems (less enzyme loading, diffusional limitations, enzyme instability) of classical immobilization methods (entrapments, adsorption, encapsulation, covalent linkage) are overcome by introducing better biocatalysts know as NBC (nanobiocatalyst) for the synthesis of various compounds. Nanobiotechnology has provided a wealth of diverse nanoscale carriers that could be applied to enzyme immobilization. Nanocarriers such as MWCNT and metal nanoparticles were used to immobilize lipases to make efficient NBCs and reactions were carried out to test the efficacy of the process.

AI: DEVELOPMENT HISTORY, HOW DOES IT WORK AND ITS APPLICATION IN RADIATION ONCOLOGY

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ABSTRACT

The term *AI* (Artificial Intelligence) was coined in the 1950s and it refers to the simulation of human intelligence by machines, especially the computer systems. It covers an ever-changing set of capabilities of new technologies are developed. Specific applications of AI include expert systems, natural language processing, speech recognition and machine vision. The foundation of machine learning started in the 18th and 19th centuries with the works of Thomas Bayes in 1763 "An Essay towards solving a Problem in the Doctrine of Chances" published two years after his death: - Bayes Theorem, a fundamental work on which a number of algorithms of machine learning is based upon it. The Bayes theorem was actually formalized by the French mathematician Pierre-Simon Laplace in 1812. The method of least squares, which is the foundational concept to solve regression problems, was formalized in 1805. In 1913, Andrey Markov came up with the concept of Markov chains.

In 1950, "Computing Machinery and Intelligence" propose by Alan Turing's seminal work. Arthur Samuel of IBM lab started working on machine learning programs, and first developed programs that could play Checkers in 1952. In 1957, Frank Rosenblatt designed the first neural network program simulating the human brain. In the next of 50 year, a number of machine learning algorithms were formulated by different researchers, e.g. the nearest neighbor algorithm in 1969, recurrent neural network in 1982, support vector machines and random forest algorithms in 1995. In October, 2006 Netflix released a dataset containing 100 million anonymous movie ratings and challenged the data mining, machine learning and computer science communities to develop systems that could beat the accuracy of its recommendation system, Cinematch. Hinton Geofrey with David Rumelhart and Ronald Williams popularized the backpropagation algorithm for training multi-layer neural networks. The dramatic image-recognition milestone of the AlexNet designed in collaboration with his students Alex Krizhevsky and Ilya Sutskever for the ImageNet challenge 2012 was a breakthrough in the field of computer vision.

In the field of oncology, early applications of machine learning were focused on treatment planning and predicting normal tissue toxicity. Its application has extended into almost every part of the field, including tumor response modeling, radiation physics quality assurance, contouring and treatment planning, image-guided radiotherapy, and respiratory motion management. The future of Deep Learning algorithm is the classification of different type of tumor based on the different diagnostic imaging, genomic and clinical pathologic data.

THIN FILMS AND SUPERSTRUCTURES FOR QUANTUM SCIENCE AND TECHNOLOGY: CAN WE CONTRIBUTE TO NATIONAL QUANTUM MISSION?

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ABSTRACT

Quantum materials, especially high-quality crystals and thin films, are leading the charge in quantum science, poised to drive technological progress and lucrative ventures. Our aims is to contribute to the development of new artificial quantum materials that can be useful for future generation quantum science and technologies in line with the newly revealed "Indian National Quantum Mission." In recent times, momentum dependent splitting of spin-bands in an electronic system, the “Rashba effect”, has gained a lot of interest because of its applications in future generation spintronic devices.[1,2] The Rashba effect is important not only because it has tremendous potential for technical applications, but also because it is a hunting ground for emergent physical properties owing to the linear dispersion relation at the crossing point of the two spin bands.[3] In this work, we present the observation of emergent phenomena arising at the interface of two insulating perovskite oxides due to Rashba spin-band splitting. In our first work, we improvise a novel conducting interface by juxtaposing KTaO3 (KTO) with another insulator, namely $LaVO_3$ (LVO).[4] This heterointerface exhibits strong spin-orbit coupling which is the highest among perovskite oxide heterostructures reported so far. The system is also found to show the signature of topological chiral anomaly via observation of planar Hall effect (PHE) and anomalous in-plane magnetoresistance (AMR) similar to that observed for topological systems. [5] In addition, surprising quantum oscillations have been observed in magneto-resistance. A nonlinear dependence of Landau index as a function of the inverse of applied magnetic field has been observed. In our next work, we show the realization of a spin polarized optically transparent interface. The quest for realizing highly spin-polarized conduction in materials at room temperature is one of the central themes of material physics. We report the realization of a conducting interface of two insulating perovskite oxides namely LaFeO3 (LFO) and SrTiO3 (STO) that demonstrates the signatures of spinpolarization, namely negative magnetoresistance, and anomalous Hall resistivity above 150 K and even up to the room temperature. However, the same system shows positive magnetoresistance and normal Hall effect at temperatures below 150 K. The origin of this could be understood phenomenologically as magnetic proximity and a topological effect of Berry’s phase originating from the nonlinear spin arrangement in the system due to thermal fluctuations at high temperatures. In addition, this interface appears to be almost transparent in the entire range of visible light. Our observation is not only of interest to fundamental science but is also viewed as a step towards “room-temperature transparent oxide-spintronics.”

SCIENTIFIC SECTIONS

SCIENTIFIC SECTIONS –DEPARTMENTS AND COORDINATORS

S. No.	Section	Departments/Centers/ institutes	Section coordinators
1.	**Basic Medical Sciences**	Biochemistry, Biophysics, Biotechnology, Microbiology, Microbial Biotechnology, Stem Cell & Tissue Engineering, Human Genome, Systems Biology & Bioinformatics, Nuclear Medicine, Public Health	Prof. S. K. Soni (sonisk@pu.ac.in) Dr. Khem Raj (khemrajthakur@pu.ac.in)
2.	**Chemical Sciences**	Chemistry	Prof. Sonal Singhal (sonal@pu.ac.in) Dr. Subash Ch Sahoo (scsahoo@pu.ac.in)
3.	**Dental Sciences**	Dr. Harvansh Singh Judge Institute of Dental Sciences & Hospital	Dr. Vishakha Grover (vishakha_grover@rediffmail.com) Dr. Mili Gupta (miligupta8@yahoo.com)
4.	**Earth and Environmental Sciences**	Geology, Geography & Environment Studies	Dr. Seema Singh (geoseema@pu.ac.in) Dr. Vishwa Bandhu Singh (vishwa@pu.ac.in)
5.	**Engineering and Management Sciences**	University Institute of Engineering & Technology (UIET) University Institute of Chemical Engineering and Technology (UICET), Sophisticated Analytical Instrumentation Facility (SAIF), University Institute of Applied Management Sciences (UIAMS), University Business School (UBS), University Institute of Hotel & Tourism Management (UIHTM), University Institute of Fashion Technology & Vocational Development (UIFT)	Prof. Vishal Gupta (vishal@pu.ac.in) Dr. Anupreet Kaur (anupreet_uiet@pu.ac.in) Dr. Maninder Kaur (maninder_uicet@pu.ac.in)

6.	**Life Sciences**	Botany, Zoology, Anthropology, Forensic Science and Criminology	Prof. Kamaljit Singh (chairman.botany@pu.ac.in) Dr. Mani Chopra (mchopra@pu.ac.in)
7.	**Mathematic sciences**	Mathematics, Statistics, Computer Science and Applications	Dr. Anju Goyal (chstats@pu.ac.in) Dr. Sudhir Goyal (sgoyal@pu.ac.in)
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9.	**Physical Sciences**	Physics, Nanoscience & Nanotechnology, Medical Physics	Prof. Vipin Bhatnagar (vipin@pu.ac.in) Dr. Sushil Singh Chauhan (schauhan@pu.ac.in)

Basic Medical Sciences

- Biochemistry
- Biophysics
- Biotechnology
- Microbiology
- Microbial Biotechnology
- Stem Cell & Tissue Engineering
- Human Genome
- Systems Biology & Bioinformatics
- Nuclear Medicine
- Public Health

CO-ORDINATORS

Prof. S. K. Soni
Dr. Khem Raj

CHASCON – 2023

National Conference on

Global Science for Global Wellbeing

SECTIONAL PROGRAMME (OCTOBER 13, 2023)
BASIC MEDICAL SCIENCES
Venue: Department of Microbiology, Panjab University, Sector-25, Chandigarh

Sectional President Professor S.K. Soni 9417351062	Sectional Secretary Dr. Khem Raj 9876726053

Time	Program
9:00 – 9:50	Display of Posters – UG/PG, Research Scholars and Teachers **Venue:** First Floor (for UG/PG) and Second Floor (for Research Scholars/Teachers) corridors of the Department of Microbiology
9:50 – 10:00	Commencement of Program **Venue:** Seminar Hall (Room No. 415), Department of Microbiology, Third Floor
10:00 – 10:45	**Session Chair:** Professor Prince Sharma **Speaker:** Professor (Dr.) Sandeep Kumar Department of Applied Science, Punjab Engineering College, Chandigarh ***"Nanomaterials Based Bioinspired Platforms for Healthcare Applications"***
10:45 – 11:30	**Session Chair:** Professor Archana Bhatnagar **Speaker:** Dr. Aruna Rakha Arora Associate Professor, Department of Translational & Regenerative Medicine (Stem Cells), PGIMER, Chandigarh ***"Stem Cells: Future of Medicine?"***
11:30 – 12:00	Tea Break
12:00 – 13:00	Oral Presentations (Faculty) **Venue:** Committee Room (Room No. 314, Second Floor), Department of Microbiology
13:00 – 14:00	Lunch
14:00 – 16:00	Oral presentations (Research Scholars) **Venue:** Seminar Room, (Room No. 415, Third Floor), Department of Microbiology Poster Presentations (UG/PG students) **Venue:** Second Floor Corridor of Department of Microbiology
14:00 – 16:00	Oral presentations (UG/PG Students) **Venue:** Lecture Hall-2, (Room No. 401, Third Floor), Department of Microbiology Poster Presentations (Research Scholars) **Venue:** Third Floor Corridor of Department of Microbiology
16:00 – 16:30	Evening Tea

ABSTRACTS OF ORAL PRESENTATIONS

PARTICIPANTS

S. No.	Name of participant	Affiliating institution	Title of abstract
1.	Suruchi Aditya	Department of Pharmacology, Dr Harvansh Singh Judge Institute of Dental Sciences, Panjab University, Chandigarh	Students' perceptions of cheating behavior: A cross-sectional study
2.	Tammanna Ravee Sahrawat	Centre for Systems Biology and Bioinformatics, UIEAST, Panjab University, Chandigarh	An insilico systems network biology study to unravel the genes and pathways of COVID-19 comorbidity-associated diseases
3.	Kamlesh Kumar Sahu	Department of Psychiatry Government Medical College & Hospital Sector 32, Chandigarh	Deprofessionalization: Meeting mental health needs in India
4.	Sonal Datta	Department of BioSciences and Technology, Maharishi Markandeshwar Deemed to be University, Mullana, Ambala, Haryana	Next-generation G-CSF variants for the prevention and treatment of Neutropenia and beyond
5.	Aditya	Panjab University, Chandigarh	A review on Mayer-Rokitansky-Küster-Hauser syndrome
6.	Annu George	Department of Microbiology, Panjab University, Chandigarh	Green cosmetology: Recombinant bacterial laccase-mediated melanin synthesis
7.	Aprajita Singla	Centre for Public Health, Panjab University, Chandigarh	An observational study on physical and social impact of virtual internet world among the adolescents
8.	Ashwini Nair	Department of Pediatrics, Postgraduate Institute of Medical Education and Research, Chandigarh	Development of gram-negative bacteremic sepsis model in wistar rat in a resource-limited setting

9.	Ayushi Sandhu	Department of Biochemistry, Panjab University, Chandigarh	Intranasal exposure of poly (I:C) exacerbates allergic asthma in mice: Potential role of neutrophils
10.	Bidhi Lord Singh	Centre for Public Health, Panjab university, Chandigarh	Disability epidemiology among male correctional facilities in Punjab, Bharat: Single-point survey
11.	Chanchal Yadav	Panjab University Chandigarh	Mapping the literature on predatory journals: A scientometric investigation based on web of science
12.	Gurmeet Kaur	School of Chemistry and Biochemistry, Thapar Institute of Engineering and Technology, Patiala	Unveiling the inhibitory mechanism of Boceprevir against SARS-COV-2 main protease activity using molecular simulations
13.	Gursimran Kaur	Department of Pediatrics, PGIMER, Chandigarh	To assess the readthrough potential of Geneticin (G418) on MMACHC nonsense mutation R132* linked to Cobalamin C defect
14.	Himanshu	Departments of Endocrinology, Post Graduate Institute of Medical Education and Research, Chandigarh	Effect of calcifediol supplementation (Vitamin D) as add-on therapy on the gene expression profile in recipients of the ChAdOx1 nCoV-19 vaccine
15.	Jitender Chandel	Department of Biochemistry, Panjab University, Chandigarh	Single exposure of PM2.5 induces lung inflammatory response characteristic of COPD: A murine model based study

16.	Lovepreet Singh	Department of Biotechnology, Panjab University, Chandigarh	Machine learning technique to differentiate between five classes of C type lectin
17.	Paravreet Kaur	Centre for Public Health, Panjab University, Chandigarh	Psychological assessment of infertile females using the Self-Reporting Questionnaire-20 (SRQ-20) in Punjab and Chandigarh
18.	Parwati Pant	Centre for Stem Cell Tissue Engineering and Biomedical Sciences, Panjab University, Chandigarh, India	Bioinformatics approach to analyse the chronic kidney disease targeted genes
19.	Rimaljot Singh	Department of Biophysics, Panjab University	To evaluate the anti-amyloidogenic activity of novel 4-PBA derivatives on the amyloid fibril formation, in vitro study
20.	Sabha Khan	Department cum National Centre for Human Genome Studies and Research, Panjab University, Chandigarh	Computational analysis of missense mutations in dystrophin protein: Insights into domain-specific effects and functional implications
21.	Satvika Sharma	Department of Biophysics, Panjab University, Chandigarh	An in vitro study on the therapeutic potential of Nano-Ostarine against glioblastoma
22.	Tanvi Vashist	Department of Medical Microbiology, Postgraduate Institute of Medical Education and Research, Chandigarh, India	Unveiling microbial diversity in necrotising soft tissue infections: A 16S rRNA next-generation sequencing approach
23.	Vibhu Joshi	Postgraduate Institute of Medical Education and Research, Chandigarh	Expression of Fc gamma receptors

			(FcγRs) in patients with Kawasaki disease
24.	Yashu Sharma	Department of Pediatrics, Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh	Deciphering the molecular landscape of mitochondrial DNA depletion syndromes: A case series
25.	Aryan Chugh	Protein Biotechnology Laboratory, Department of Biotechnology and Food Technology, Punjabi University, Patiala	Potential applications of immobilized fungal keratinase in laundry and leather industry
26.	Divya Dora	Bachelor of Homoeopathic Medicine and Surgery, Homeopathic Medical College and Hospital, Chandigarh	A KAP study to assess awareness about Eye flu (Conjunctivitis) as a public health problem among medical students
27.	Divya Kaushal	Department of Bioinformatics, Goswami Ganesh Dutta Sanatan Dharma College, Sector- 32 C, Chandigarh	String and Haddock - assisted interactive network prediction for virulence effector molecules of Salmonella
28.	Gurkeerat Kaur	Department of Microbiology, Panjab University, Chandigarh	Green synthesized silver-graphene derivatives-based nanocomposites: Preparation, its antifungal potential and its biomedical applications
29.	Jyoti Thomke	Centre for Stem Cell and Tissue Engineering, Panjab University, Chandigarh	Benefits of Neem in gynecological cancer
30.	Kimmi Saini	Bachelor of Homoeopathic Medicine and Surgery, Homeopathic Medical College and Hospital, Chandigarh	Data and privacy: An ignored subject
31.	Loveena Pathak	Department of Microbiology, Punjab Agricultural University, Ludhiana	Assessment of plant growth promoting Rhizobacteria for the improved growth and

			nutritional content of groundnut
32.	Naman Sharma	Homeopathic Medical College and Hospital, Chandigarh	Mycotoxins: The hidden danger in food
33.	Prerna Goel	Centre for Systems Biology and Bioinformatics, Sector 25, South Campus, Panjab University, Chandigarh - 160014, India	Unraveling molecular pathways and therapeutic targets in ADPKD associated CKD and ESRD
34.	Rashi Jain	Systems Biology and Bioinformatics, Panjab University, Chandigarh	Identifying biomolecular signatures for diabetic nephropathy and membranous nephropathy: A comparative bioinformatics analysis
35.	Shiwani	Centre for Systems Biology and Bioinformatics, Sector 25, South Campus, Panjab University, Chandigarh, India	Exploring molecular biomarkers for prognosis in papillary renal cell carcinoma: A bioinformatics approach
36.	Varinder Madhav Verma	Centre for Systems Biology and Bioinformatics, Panjab University, Chandigarh	Transxplorer: A bioinformatics-based tool for navigating RNA-seq insights with ease
37.	Yashika Aggarwal	Department of Microbiology, Punjab Agricultural University, Ludhiana	Enhancement of biogas production from sweet Sorghum stalks using microbial interventions

OP1. STUDENTS' PERCEPTIONS OF CHEATING BEHAVIOR: A CROSS-SECTIONAL STUDY

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ABSTRACT

Objective: To assess prevalence of, attitude towards and perceptions about cheating behavior among dental undergraduate students. Materials and methods: This was a cross-sectional, descriptive study using an anonymous questionnaire with yes/no, rank-order, open-ended, and Likert-type rating scale questions exploring prevalence of, forms of and means to reduce cheating behavior in dental students. The tool was pre-tested and validity and reliability were ensured. The questionnaire consisted of demographic, informational, behavioral, justification, and critical thinking questions. Informed consent form was filled by the participants. Results: 78 second-year undergraduate dental students participated in the study. The most common forms of cheating were allowing other students to copy his/her work (68%), copying assignments from another students (62%), and working with another student on an assignment that should have been done independently (60%). The top three personal reasons given for cheating behavior were overload of demands of college (62%), did not know the material (58%) and to help a classmate pass a course (54%). The other factors reported were to save time, did not feel it was serious and easy opportunity. The methods suggested to decrease cheating behavior were to not overload the students with work, decrease pressure of completing practical workload near examination time and enforce heavier penalties for cheating. Conclusion: The study highlights that it is important to promote academic integrity by increasing students' awareness about academic dishonesty and its consequences.

OP2. AN INSILICO SYSTEMS NETWORK BIOLOGY STUDY TO UNRAVEL THE GENES AND PATHWAYS OF COVID-19 COMORBIDITY-ASSOCIATED DISEASES

Tammanna Ravee Sahrawat[1]

[1]*Centre for Systems Biology and Bioinformatics, UIEAST, Panjab University, Chandigarh*

ABSTRACT

A major challenge that has emerged in the last few decades is comorbidity which refers to the presence of more than one disease in individuals. A large number of epidemiological and demographic studies have reported an association among COVID-19 and other disease comorbidities but there are no reports on the molecular basis of co-morbidity of these diseases. Consequently, a lacuna exists in the knowledge of common genes/proteins and associated pathways amongst these diseases and COVID-19. The present study was undertaken to identify genes and pathways shared amongst COVID-19 associated-comorbidity diseases using an *in silico* systems network biology approach, for understanding the molecular underpinnings that are responsible for or contribute to the reported severity. A bioinformatics analysis of COVID-19 comorbidity-associated genes from various knowledge bases was performed to identify genes and pathways shared amongst the comorbidities followed by

pathway enrichment and data mining. Phenotypic analysis of shared hub genes amongst six disease COVID-19 associated comorbidities (cardiovascular disease, diabetes mellitus, hepatitis, pulmonary fibrosis, and kidney disease) revealed significant enrichment and direct involvement in immunological pathways. Each of the hub proteins were found to have significant associations with entry receptors of COVID-19 virus, making the patients suffering from any of the comorbidities more prone to infection by SARS-CoV-2. Therefore, it is concluded that the higher risk factors to COVID-19 in patients having disease co-morbidities is associated majorly with immune dysfunction. The study indicates a direct association between host genetics and consequences of viral infection that is responsible for severity of comorbidities with COVID-19.

OP3. DEPROFESSIONALIZATION: MEETING MENTAL HEALTH NEEDS IN INDIA

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[1]*Department of Psychiatry Government Medical College & Hospital Sector 32, Chandigarh*

ABSTRACT

The *mental health* crisis in *India* necessitates innovative solutions, and "deprofessionalization" emerges as a compelling approach. This abstract explores the concept that deprofessionalization may be the most effective way to address *India*'s growing *mental health* needs. *India* faces a severe shortage of *mental health* professionals, limiting access to care. *Deprofessionalization* challenges the conventional reliance on specialists like psychiatrists and psychologists. Instead, it broadens the scope of *mental health* services to include trained non-specialists, community health workers, and peer counsellors. Leveraging technology and telehealth, this approach encourages community-based, decentralized *mental health*care. *Deprofessionalization* empowers communities to take ownership of their mental well-being, reducing stigma and aligning with cultural norms. It recognizes the significance of cultural and spiritual dimensions in *mental health* care. While challenges like quality assurance and training persist, innovative models such as task-shifting, collaborative care, and digital *mental health* platforms provide solutions. This shift has the potential to transform *India*'s *mental health* landscape, making services more accessible, culturally sensitive, and cost-effective. In conclusion, deprofessionalization offers a promising avenue to address *India*'s escalating *mental health* needs. It emphasizes community engagement, technology, and cultural sensitivity. Embracing this approach could revolutionize *mental health*care delivery, making it more inclusive and responsive to the diverse needs of *India*'s population.

OP4. NEXT-GENERATION G-CSF VARIANTS FOR THE PREVENTION AND TREATMENT OF NEUTROPENIA AND BEYOND

Monika Kumari[1], Akshit Vikram Jain[1], Girish Sahni[1], Sonal Datta[2]

[1]CSIR Institute of Microbial Technology Sector 39A Chandigarh, [2] Department of BioSciences and Technology Maharishi Markandeshwar Deemed to be University Mullana Ambala Haryana

ABSTRACT

Granulocyte-colony stimulating factor (G-CSF) and PEGylated G-CSF versions are administered to prevent chemotherapy-induced neutropenia. They are considered a major reason for the success of chemotherapy-based cancer treatment. Recent research has demonstrated several new clinical applications of G-CSF beyond neutropenia. However, these indications demand a longer half-life and improved biological activity. Earlier, we engineered a construct for high-yielding tag-less expression of G-CSF in E. coli and developed a bioprocess for efficient purification. The current methods of G-CSF PEGylation are associated with heterogeneous PEGylation at the amino group of lysine residue/s present in G-CSF protein, in addition to the desired PEGylation at the N-terminal amino group. To improve the biological activity of G-CSF, we have utilized computational biology to identify suitable sites for efficient PEGylation and developed strategies for increasing in vivo biological activity. We employed site-specific PEGylation wherein cysteine insertions/substitutions are introduced at strategically defined sites such that the activity of the G-CSF is not perturbed. These sites also have higher solvent accessibility for efficient and homogenous G-CSF PEGylation. These variants were engineered and cloned in an expression vector for high protein expression. The PEGylation reaction conditions, purification of PEGylated G-CSF protein, and its physicochemical characterization were standardized. Furthermore, we have established an in vivo neutropenia mice model to analyze the biological activity of G-CSF variants. Importantly, the engineered variants possess prolonged biological activity. These PEGylated G-CSF variants could potentially replace the existing pegylated G-CSF and may be used in applications wherein a longer half-life of G-CSF is required.

OP5. A REVIEW ON MAYER-ROKITANSKY-KÜSTER-HAUSER SYNDROME

Aprajita Gupta[1], Aditya[1]

Panjab University, Chandigarh

ABSTRACT

MRKH, or Mayer-Rokitansky-Küster-Hauser syndrome also known as Müllerian agenesis or genital aplasia, is a congenital disorder that primarily affects the female reproductive system. It's characterized by agenesis or hypoplasia of the uterus and upper part of the vagina but with functional ovaries, while the external genitalia appear normal. There are two types of MRKH syndrome (1) Type I (isolated uterovaginal aplasia) Involves the absence or underdevelopment of uterus and upper 2/3 vagina, with normal external genitalia, (2) Type II (associated with extragenital manifestations) is Similar to Type I but it is associated with abnormalities in other

body systems, such as missing or underdeveloped kidneys, Skeletal Anomalies, Hearing Problems, Cardiac Issues and Other Organ Abnormalities. Females with MRKH showing normal secondary sexual characters with normal 46, XX karyotype. The incidence of MRKH syndrome has been estimated as 1 in 5000 female births. The first noticeable sign of MRKH syndrome is primary amenorrhea. There are surgical (uterus transplant) and non-surgical (self-dilation) options as treatment. The syndrome appears to demonstrate an autosomal dominant inheritance pattern, with incomplete penetrance and variable expressivity. Mutations of several candidate genes have been proposed as possible causes based on genetic analyses of human patients and animal models. Employing various genomic techniques has enabled discovery of recurrent genetic anomalies in certain patients, showing promise in understanding genetic factors contributing to the syndrome. This comprehensive review offers an up-to-date overview of several crucial aspects of syndrome and outlines potential directions for future research and enhancement in clinical care.

OP6. GREEN COSMETOLOGY: RECOMBINANT BACTERIAL LACCASE-MEDIATED MELANIN SYNTHESIS

Ritul[1], Annu George[1], Neena Capalash[2], Prince Sharma[1]

[1]*Department of Microbiology, Panjab University, Chandigarh,* [2] *Department of Biotechnology, Panjab University, Chandigarh*

ABSTRACT

Melanin, a universal natural dark polymeric pigment, plays a vital role as an ingredient in sunscreens, antioxidants, and various cosmetic formulations. Global melanin market is expected to grow to USD 18 million by 2028. Compared to gold ($... per gram), the net worth of melanin is $544 per gram. The upcoming demand because of its wide applicability, has focused research on more production of natural melanin. To overcome the negative impact of synthetic melanin and to increase productivity, we aimed at the production of natural, toxin-free eumelanin from L-DOPA, a natural precursor, through enzymatic oxidation by bacterial recombinant laccase. *Rheinheimera* sp. laccase was heterologous expressed in *E. coli* using pET28a vector and purified using Ni- NTA column. Purified laccase polymerized L-DOPA to eumelanin optimally at pH 7 and 50 °C. Eumelanin was simply purified by centrifugation at 4000 x g for 15 min and characterized by FTIR analysis and UV-visible spectra that confirmed that purified melanin was like human eumelanin produced by melanocytes. When treated with ABTS radical cations, it demonstrated 87.65% free radical scavenging (antioxidant) activity. The purified melanin can be produced at large scale and used for various cosmetic applications.

OP7. AN OBSERVATIONAL STUDY ON PHYSICAL AND SOCIAL IMPACT OF VIRTUAL INTERNET WORLD AMONG THE ADOLESCENTS

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ABSTRACT

Introduction: Virtual reality is an interactive computer-generated experience that takes place in a simulated environment and includes primarily auditory and visual feedback. A cyberspace is a virtual reality network. It has been shown that internet gamers can experience isolation, leading to depression, anxiety, and difficulty dealing with the real world. In today's world everyone is involved in cyber world through mobiles and computers. These are lifestyle disorders which are emerging as threat to health and social interactions. Therefore, it is a need of time to study and research about effects of virtual reality on community so that we can prevent adverse effects which are the main goal of public health research. Objective: To assess the effect of virtual internet world on the health and social interactions of the adolescents. Methodology: Study is being conducted on Adolescent (10–19-year-old) in Chandigarh. It is a cross sectional observational community-based study. Self-designed Questionnaire is used for assessing health and social impact. It is a part of PHD research. Sample size was calculated on basis of 30% internet addiction among adolescent with 95% confidence level and 4% relative precision. 360 was sample size for adolescents. 200 participants from 10-14 years and 160 from 15-19 years will be taken. Ethically approved from Ethical Committee of Panjab University. Analysis will be done with MS Excel and IBM SPSS. Study period is April 2023 –October 2023. Results Data collection is under process and results will be shared in the conference.

OP8. DEVELOPMENT OF GRAM-NEGATIVE BACTEREMIC SEPSIS MODEL IN WISTAR RAT IN A RESOURCE-LIMITED SETTING

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ABSTRACT

Introduction: Majority of available rat models of bacteremic sepsis have significant limitations, e.g., high inter-model variability, high cost, limited reproducibility and ethical issues. We developed an easily reproducible E. coli bacteremic rat model at lower cost requiring minimal standardization. Material & Methods: E. coli (ATCC 25922) was sub-cultured in blood agar at 37℃ for 24h. Turbidity of bacterial saline suspension was compared with Mac-Farland turbidity standard (optical density of 4 at 630nm corresponded to 1.2x109cfu/ml). Different dilutions were prepared from this standard suspension. Ten wistar rats (age, 61-117days; weight, 167-350gm; 5 groups of 2 each) received 10ml of different

concentrations of suspension intraperitoneally— Group A(4.8x108CFU/ml), Group B(3.6x108CFU/ml), Group C(2.4x108CFU/ml), Group D(2.2x108CFU/ml) and Group E(2.0x108CFU/ml). Rats were observed daily for signs of sepsis. After ~24h, retro-orbitally obtained blood was cultured in MacConkey agar. Signs and mortality were continued to be monitored. Result: All blood samples were positive for *E. coli* ATCC 25922 on culture and MALDI-MS. Rats in Groups A, B and C died within 24h, while rats in Group D died between 24h and 36h. Group E rats developed necrotic patch at inoculation site after 2 days, and remained healthy until 10 days. Group D was considered a preferred sepsis model providing a crucial window for potential therapeutic interventions. Group D protocol was validated with a sample of six rats (age77; weight160-210). Lethality was 100% between 24h and 36h of intraperitoneal inoculation. Conclusion: Described bacteremic sepsis rat model may be a valuable but simple experimental tool for therapeutic interventions.

OP9. INTRANASAL EXPOSURE OF POLY (I:C) EXACERBATES ALLERGIC ASTHMA IN MICE: POTENTIAL ROLE OF NEUTROPHILS

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ABSTRACT

Respiratory infections caused by viruses are known to be prominent contributors to the worsening of asthma symptoms. Poly (I:C), a structural analogue of dsRNA, is frequently employed to investigate the immune responses associated with respiratory viral infections. The present study aims to analyze the impact of poly (I:C) on asthma exacerbation. Further, protective effect of dexamethasone, a steroidal class of drug was evaluated under the condition. Female BALB/c mice were sensitized and challenged with Ovalbumin (OVA), followed by intranasal administration of poly (I:C)/PBS. Dexamethasone was administered intraperitoneally prior to poly (I:C) instillation. The animals were assessed for airway hyperresponsiveness (AHR), as a marker of lung function. In addition, bronchoalveolar lavage fluid (BALF) was procured to evaluate the inflammatory response. OVA-exposed mice exhibited a significant increase in total BALF inflammatory cells, prominently eosinophils. Intriguingly, poly (I:C) at a dose of 200µg augmented lung inflammation in OVA-exposed mice. Remarkably, poly (I:C) reduced the eosinophil count following OVA exposure but led to substantial increase in the neutrophils. Dexamethasone failed to affect poly (I:C) mediated recruitment of neutrophils in the lungs. Additionally, mice exposed to OVA/poly (I:C) developed AHR as reflected by an increase in specific airway resistance (sRaw), which was not altered by dexamethasone. Our findings suggest that poly (I:C) treatment in OVA-exposed mice seems to switch the inflammatory response from eosinophils to neutrophils, which may account for dexamethasone's inability to suppress the lung inflammation/AHR under the condition.

OP10. DISABILITY EPIDEMIOLOGY AMONG MALE CORRECTIONAL FACILITIES IN PUNJAB, BHARAT: SINGLE-POINT SURVEY

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ABSTRACT

Introduction: *Disability* is a significant global public health concern, impacting millions of individuals and posing various public health, social, and economic challenges. The impact of disability is particularly pronounced by incarceration in developing nations like India. Aim and Objective: The study aimed to determine the prevalence of disability among male prison inmates in Punjab, India. The objective of study was to assess the levels of difficulty across multiple domains of disability, including vision, hearing, mobility, cognitive function, self-care, and communication. Methodology: A cross-sectional survey was conducted among 424 male prison inmates aged over 30 years incarcerated in three distinct purposively selected correctional facilities in Punjab. Inmates were assigned a unique identification number based on simple random sampling. Data collection was facilitated through the administration of the *Washington Group-Short Set* (WG-SS) questionnaire, designed to assess disability across various dimensions. Ethical aspect: The ethical approval was granted by institutional ethical committee, Panjab University, Chandigarh. Written consent was obtained from the participants. Results: The study findings revealed the inmates reported some difficulty in seeing (53.1%), hearing (20%), mobility (10.8%), memory and concentration (20%), self-care (0.7%) and communication (0.2%) whereas experiencing a lot of difficulty in seeing (10.4%), hearing (1.2%), mobility (1.7%), memory and concentration (6.4%), and self-care (0.2%). Conclusion: our study's results demonstrate varying levels of disability among male prison inmates in Punjab, emphasizing need for the development and implementation of comprehensive and effective healthcare policies and practices tailored to this marginalized population.

OP11. MAPPING THE LITERATURE ON PREDATORY JOURNALS: A SCIENTOMETRIC INVESTIGATION BASED ON WEB OF SCIENCE

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ABSTRACT

This study performs a scientometric review of the literature published on predatory publishers and outlines the core elements of published documents and obtains the range of areas researched within the field of the predatory journal (PJ) using Bibliometrix and VOSviewer. A total of 771 documents from the Web of science (WoS) database was analyzed. The analysis revealed the dominance of the medical field in this topic. The analysis shows that about 50%

of the list of most influential authors belong to affiliations that are in the list of most influential affiliations. Also, the majority of authors in the list of most influential authors belong to developed countries. This suggests that academic institutions in developed countries are more actively engaged in research on predatory publishing and are producing more impactful work. The study's findings align with earlier research that indicated developing countries have a lower rate of publication on predatory publishing and are less aware of its practices compared to developed countries. The Learned publishing, Scientometrics and Nature are the most productive sources with a document count of 36, 36, 20, respectively. It is noteworthy that countries such as the USA, India, were listed for having headquarters of predatory publishers, yet these countries fall in the top five list of most prolific countries in the present study. This signifies that in spite of a good productivity on PJ these countries have been unable to find ways to prevent mushrooming.

OP12. UNVEILING THE INHIBITORY MECHANISM OF BOCEPREVIR AGAINST SARS-COV-2 MAIN PROTEASE ACTIVITY USING MOLECULAR SIMULATIONS

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ABSTRACT

The main protease (Mpro) of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is a prominent drug target as it plays a key role in viral replication and is greatly conserved in the coronaviruses with no homologues in the human genome. Ma et al. reported boceprevir, an FDA-approved hepatitis C virus drug, for inhibiting SARS-CoV-2 Mpro activity (IC50= 4.13 ± 0.61 μM). However, how boceprevir inhibits Mpro activity remains unexplored. Thus, molecular dynamics (MD) simulations have been performed in this work to examine the mechanistic basis of the high-affinity binding of boceprevir with Mpro. The molecular docking analysis depicted a strong binding (–7.5 kcal/mol) of boceprevir to Mpro due to its hydrogen bond interactions with catalytic dyad (Cys145) and oxyanion hole residues (Asn142, Gly143) of Mpro. The hydrogen bond analysis highlighted that boceprevir interacted with the residues, Asn142 and Gly143, *via* hydrogen bonds and blocked the active site of Mpro. The binding free energy analyses using MM-PB(GB)SA [molecular mechanics Poisson-Boltzmann (Generalized-Born) surface area] approaches demonstrate the significant contribution of the van der Waals and non-polar solvation components in the binding of boceprevir to Mpro. The energy-minima conformation extracted from the free energy landscape of Mpro-boceprevir displayed a hydrogen bond interaction of boceprevir with residue Asn142 of Mpro, which plays a key role in its proteolysis reaction. The MD simulations illuminated key interactions of boceprevir with the residues lining the subpockets of the active site of Mpro, which is consistent with its high-affinity binding with Mpro observed in the *in vitro* studies.

OP13. TO ASSESS THE READTHROUGH POTENTIAL OF GENETICIN (G418) ON MMACHC NONSENSE MUTATION R132* LINKED TO COBALAMIN C DEFECT

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ABSTRACT

Background: Cobalamin-C defect is the most common inborn error of intracellular cobalamin metabolism. The nonsense-mutation, c.394C>T (R132*), resulting in truncated protein, was common in our cohort. Based on the location of this mutation, it can be targeted for readthrough drug therapeutics for restoring the *MMACHC* activity. Methods: We created stable mammalian cell lines expressing wildtype (WT) and mutant (R132*) *MMACHC* protein to check the efficacy of readthrough drugs. WT cDNA clone of *MMACHC* gene was purchased and mutant clone (R132**_MMACHC*) was prepared by site-directed mutagenesis. WT and R132**_MMACHC* constructs were subcloned into mammalian expression vector (pcDNA5FRT) along with EGFP sequence. Vectors were transfected into Flp-In CHO cell line. Mutant Flp-In cells were treated with G418 at different concentrations and time intervals. Protein expression was analysed by western blot. Results: Pure population of transfected cells was isolated within three-week timeframe, and subsequent to this, total protein was extracted from Flp-In cell line carrying WT and mutant clones. Western blot showed good expression in WT cells; however, no expression of GFP tagged protein was observed in mutant (R132*) cells suggesting no expression of *MMACHC* with this mutation. On treating R132* Flp-In cell with different concentrations of G418, protein expression at 24 hrs was restored at 15µg/ml with relatively higher band intensities at 100-750µg/ml of G418. However, at 72 hrs, protein expression exponentially increased with G418 concentration. Conclusion: The observed readthrough impact of G418 on *MMACHC* nonsense-mutation at position R132* suggests the possibility of restoring the function of truncated R132* *MMACHC* protein.

OP14. EFFECT OF CALCIFEDIOL SUPPLEMENTATION (VITAMIN D) AS ADD-ON THERAPY ON THE GENE EXPRESSION PROFILE IN RECIPIENTS OF THE CHADOX1 NCOV-19 VACCINE

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ABSTRACT

The ChAdOx1 nCoV-19 (COVISHIELD) vaccine has emerged as a pivotal tool in the global fight against the COVID-19 pandemic. To enhance the immunogenicity of the vaccine, some

recipients have received supplementation with calcifediol, a direct precursor to the biologically active form of vitamin D. In this study, we investigated the effects of calcifediol supplementation on gene expression profiles in individuals who received the COVISHIELD vaccine for over six months. Peripheral blood samples were collected from vaccine recipients with and without calcifediol supplementation, and gene expression profiles were analyzed using high-throughput sequencing techniques and complex computation analysis. The clinical parameters examined in our study not only shed light on the dynamics between calcifediol, PTH, calcitriol, and calcium concentrations but also emphasize the role of vitamin D as a clinical adjunct. Our results reveal distinct patterns of gene expression associated with calcifediol supplementation, An optimally concentration of calcifediol has the potential to establish a microenvironment that facilitates the initiation of T cell activation, robust cytokine signaling, heightened innate immune responses and downregulation of coronavirus disease. Overall Our study's comprehensive analysis of calcifediol supplementation, gene expression, and clinical parameters offers a holistic perspective on the potential clinical benefits of this strategy. The observed correlations emphasize the importance of maintaining optimal vitamin D status for immune responses, calcium homeostasis, and overall health. The findings underscore the potential clinical benefits of calcifediol supplementation as an adjunct to vaccination strategies, offering avenues for personalized healthcare approaches and improved immune outcomes.

OP15. SINGLE EXPOSURE OF PM2.5 INDUCES LUNG INFLAMMATORY RESPONSE CHARACTERISTIC OF COPD: A MURINE MODEL BASED STUDY

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ABSTRACT

COPD is a complex lung disease with chronic inflammation and irreversible airflow obstruction. Cigarette smoke is one of the major causes of COPD, but in recent studies, the exposure to particulate matter (PM2.5) is reported to correlate closely with COPD incidence. However, the pathogenic mechanisms behind PM2.5-induced COPD are not well understood. Accordingly, the present work was conducted to evaluate the effects of PM2.5 on lung inflammation and pulmonary function by carrying out a dose response study (50, 100, or 200µg) using male BALB/c mice. Briefly, PM2.5 was given intratracheally once and BALF cells were differentially quantified at different time points (2, 4, 7, 14, 21, or 28 days). Further, lung function parameters and histopathological changes in the lungs were examined. Analysis of BALF cells revealed that the inflammatory response was negligible 2 days following the instillation of PM2.5 at any of the doses (50, 100, or 200µg). In contrast, a strong inflammation was detected after 4 days in response to the doses of 100 and 200µg. PM2.5-induced inflammation peaked at day 7 and continued until day 14, and then subsided at day 21. Double chambered plethysmography of mice reveals a progressive deterioration of lung function up to day 28 during the pulmonary function test. Further, in the histological studies, we observed emphysematous lesions in the lung tissues after 28 days of PM2.5 exposure which confirmed

the irreversible lung damage due to PM2.5. Thus, our findings indicate that PM2.5 progressively causes alterations in the lungs which are typical of COPD.

OP16. MACHINE LEARNING TECHNIQUE TO DIFFERENTIATE BETWEEN FIVE CLASSES OF C TYPE LECTIN

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ABSTRACT

Background and Objective: C type lectins are an important class of lectins which require calcium for binding. C type lectins are categorised into total of seveteen classes based on functions and architecture. We wanted to test whether machine learning algorithm can differentiate between sub families of c type lectins. We used the five subfamilies to test our hypothesis. Thes five classes were collectin, selectin, asialoglycoproteins receptors, multi endocytic c type receptors and lecticans. Methodology: We created a dataset of 5 sub families of c type lectin. Then we wrote a python script to count dipeptides in each of the protein sequence in dataset. We converted our fasta protein sequences into 400 vector dipeptide count arrays. We used sklearn library in python programming language for training and testing. From this library we used C-Support Vector Classification also known as svc. The dataset was randomly split into 70 % for training purpose and 30 % for testing purpose. Results: The set up was able to distinguish between collectin, selectin and Asialoglycoproteins receptor classes. More data was needed for Multi endocytic c type receptors and lecticans. Overall accuracy was 0.98. Significance of study: SVC classifier may be used to classify the sub families of c type lectin family. We should use a larger dataset to increase the efficacy of machine learning algorithms.

OP17. PSYCHOLOGICAL ASSESSMENT OF INFERTILE FEMALES USING THE SELF-REPORTING QUESTIONNAIRE-20 (SRQ-20) IN PUNJAB AND CHANDIGARH

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ABSTRACT

Introduction The inability to bear children is a tragedy for a female. The conflux of personal, interpersonal, social and religious expectations brings a sense of failure, loss, and exclusion to those who are infertile. An estimated 48.5 million couples worldwide experience infertility. The prevalence of current infertility, ranges from 3.5% to 16.7% in more developed nations and from 6.9% to 9.3% in less developed nations. Depression and anxiety are highly prevalent among infertile women. 25% to 60% of infertile individuals report psychiatric symptoms. In similar light, a study was conducted to assess the psychological impact (of infertility) on infertile females in comparison with the fertile females. Methodology A cross sectional study was conducted in Punjab and Chandigarh. Through random sampling, 25 ART clinics were selected. From these 25 ART clinics, 100 infertile females were selected randomly (4 from

each ART clinic; 4 X 25=100). Similarly, 100 age matched fertile females (control group) were enrolled from general population and those visiting health facilities for reasons other than infertility. These infertile and fertile females were interviewed for psychological impact through Self-Reporting Questionnaire-20 (SRQ). Results The analysis is in process as it is a part of PhD thesis. The results will be presented in the conference.

OP18. BIOINFORMATICS APPROACH TO ANALYSE THE CHRONIC KIDNEY DISEASE TARGETED GENES

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ABSTRACT

Chronic Kidney Disease (CKD) is a wide-ranging nephropathic condition that develops when the kidney's structure and function are compromised. It is a global public health issue afflicting millions of people from all racial and ethnic backgrounds. About 8%-16% of the world's population has chronic kidney disease due to lack of proper screening, staging, diagnosis and management. Furthermore, the gene expression profile of CKD is currently unknown, despite the widespread use of gene expression research to clarify a variety of biological processes. Our study is an approach towards resolving these gaps in the treatment procedure. The integration of computational analyses was done for the pathway-functional enrichment of genes involved in chronic kidney disease. The Ingenuity Pathway Analysis (IPA) reveals the involvement of targeted genes in multiple interaction networks that can be predicted as the background causes of our case disease. These genes including TNF, TGFβ regulate important molecular activities related to activation, growth and death of various cells. The findings are correlated further with literature and current available datasets which provide an insight to better understand the disease. The thorough investigation of mechanistic networks regulating the onset of CKD and its various pathophysiology necessitates the dissection of various causal factors. These observations unravel a functional aspect of genes significantly involved in disrupting the kidney system and structure. Thus, harnessing our knowledge a step towards the development and treatment of chronic kidney disease.

OP19. TO EVALUATE THE ANTI-AMYLOIDOGENIC ACTIVITY OF NOVEL 4-PBA DERIVATIVES ON THE AMYLOID FIBRIL FORMATION, IN VITRO STUDY

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ABSTRACT

Aim: Aβ is the prime constituent of amyloid plaque found in the brains of Alzheimer's disease (AD) patients. Chemical chaperones like 4-Phenylbutyrate (4-PBA), interact with the

hydrophobic region of the unfolded or misfolded proteins and prevent their aggregations. The role of 4-PBA has already been exploited for its anti-aggregation ability, however, a higher dosage is required to see positive effects, so, further treatment optimization is the need of the hour. In this study, we examined the potential of novel 4-PBA derivatives as drug candidates against Aβ42 aggregation using a Thioflavin T (ThT) binding assay. Methods: Herein, a huge library of 4-PBA-based derivatives was constructed followed by the evaluation of their binding potential with amyloid beta fibrils (PDB:2MXU) using Schrödinger software. The identified lead compounds filtered based on dock scores and ADME profiles were synthesized. Dithiothreitol (DTT) assay, Thermal aggregation assay, and ThT binding assay were used to examine the effects of novel synthesized derivatives on preventing Aβ42 fibril formation. Results: With the dock scores -6.108, -5.058, and -4.520, compounds RJ1, RJ2, and RJ3 respectively showed potent inhibitory activity against amyloid beta fibril in comparison to the parent scaffold 4-PBA (-4.171). To further investigate the relationship between novel compounds and Aβ42 fibril formation, a ThT binding assay was performed. The compound RJ3 significantly suppressed the aggregation of Aβ42 to around 35% after an incubation of 24 hours. Conclusion: The compounds RJ1, RJ2, and RJ3 demonstrated significant neuroprotective ability thus making them potential candidates for the development of drugs for treating AD.

OP20. COMPUTATIONAL ANALYSIS OF MISSENSE MUTATIONS IN DYSTROPHIN PROTEIN: INSIGHTS INTO DOMAIN-SPECIFIC EFFECTS AND FUNCTIONAL IMPLICATIONS

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ABSTRACT

Proteins are complex molecules, made up of one or more polypeptide chains, critical for most of the function of the cells. Dystrophin is a protein primarily found in skeletal muscle cells. The N-terminal domain of dystrophin binds to F-actin and Cysteine rich domain interacts with Dystrophin-Associated Protein Complex (DAPC). Dystrophin serves as a link from the actin-based cytoskeleton of muscle cells through the plasma membrane to the extracellular matrix. This complex works together to strengthen muscle fibres and protect them from injury as muscle contract and relax. Occurrence of pathogenic mutations in dystrophin can lead to either Duchenne Muscular Dystrophy [DMD] or Becker Muscular Dystrophy [BMD] or X-Linked dilated cardiomyopathy (CMD3B). Missense mutations represent a subset of genetic mutations that leads alteration in amino acid sequence and potentially affects protein structure and function. In this work, we examined the effect of disease-causing missense mutations in dystrophin protein lying in different domains namely- N-terminal actin-binding domain (K18N, A165V, Y223N, and Y227N) and Cysteine-rich domain (D3187G, D3179G, D3183G, F3228L).Missense mutations in N-terminal domain impacts actin binding of dystrophin through changing the structure and stability of protein and cysteine rich domain mutations can lead to aggregation of protein or decrease in thermal stability leading to functional impairment of dystrophin.

OP21. AN IN VITRO STUDY ON THE THERAPEUTIC POTENTIAL OF NANO-OSTARINE AGAINST GLIOBLASTOMA

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ABSTRACT

Glioblastoma, a severe grade IV brain cancer, is conventionally treated with aggressive radiation and chemotherapy, bearing significant side effects. However, there is a need to explore alternatives, given the association between overexpressed Androgen Receptors (AR) in glioma cells and prostate cancerous cells. Clinically, AR antagonists like Bicalutamide have limited use due to concerns about potential transcriptional disruptions. To address these challenges, Selective Androgen Receptor Modulators (SARMs) like Ostarine, an analog of Bicalutamide, are being investigated for potential treatment of gliomas. Drug delivery to the brain is hindered by the blood-brain barrier, but nano-formulation of drugs offers a promising solution. Ostarine-loaded polymeric nanoparticles (Poly Lactic co- Glycolic Acid) were developed via solvent extraction method. Characterization revealed stable, uniform nanoparticles (~200 nm) with a zeta potential of -23 mV. Drug release studies demonstrated continuous, sustained release over 48 hours. Biodistribution tracking with a fluorometer showed peak fluorescence at 1 and 2 hours, with continuous excretion for 48 hours. In vitro experiments on C6 glioma cells demonstrated Ostarine's superior therapeutic potential compared to Bicalutamide. This research holds promise for a more effective, less harmful treatment approach for glioblastoma, though further clinical evaluation is needed.

OP22. UNVEILING MICROBIAL DIVERSITY IN NECROTISING SOFT TISSUE INFECTIONS: A 16S RRNA NEXT-GENERATION SEQUENCING APPROACH

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ABSTRACT

Necrotising Soft-tissue infections (NSTIs) encompass a spectrum of infections that span from the skin's outer layer to deep muscle tissues, resulting in rapid destruction of skin, muscles, and fascia. These infections are caused by bacteria that invade soft tissues, impeding blood supply and leading to tissue necrosis. NSTIs can manifest in various body regions, with the extremities, perineum, and abdomen being common sites. Diagnosing severe NSTI cases presents significant challenges and often leads to high mortality rates, especially in poly-microbial NSTIs, where microbial diversity tends to be underestimated, particularly in the context of fastidious microorganisms. To address this diagnostic challenge, we employed prokaryotic 16S ribosomal genes and their intergenic regions, known for their conserved and variable sequence stretches. Our study aimed to directly evaluate the microbial diversity within

patient tissues by targeting the V3-V4 region of the 16S rRNA gene using next-generation sequencing (NGS). We categorised patient tissue biopsies diagnosed with Necrotising soft tissue infections into two groups: Group A included samples from the extremities, while Group B comprised samples from other body regions. We harnessed Illumina MiSeq sequencing for pathogen identification within these tissues through 16S rRNA gene amplification. By employing taxonomic profiling, OTU clustering, and core microbiome analysis, we unveiled key taxa within each group. Noteworthy species, including *Streptococcus pyogenes*, *Morganella morganii*, and *Bacteroides fragilis*, among others, were identified in both groups. This approach holds promise for expediting surgical assessments, particularly in resource-constrained settings.

OP23. EXPRESSION OF FC GAMMA RECEPTORS (FCΓRS) IN PATIENTS WITH KAWASAKI DISEASE

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ABSTRACT

Introduction: Kawasaki disease (KD) is acute febrile systemic vasculitis that affects coronary arteries. Administration of high dose intravenous immunoglobulin (IVIg) provides a prompt anti-inflammatory effect, though mechanisms are not clearly understood. Fc gamma receptors (FcγRs) are suggested to have important role in mechanism of IVIg action as well as in IVIg resistance and development of coronary artery aneurysms (CAAs) in patients with KD. In current study, we characterize the surface expression of FcγRs (FcγRI, FcγRII, FcγRIII) in Indian patients with KD. Material and Methods: Treatment naïve children with KD and post treatment with IVIg were enrolled. Characterization of surface expression of FcγRs was done using flow cytometry. Results: Percentage expression of FcγRI on neutrophils was significantly higher while expression of FcγRIIIA and FcγRIIIB was significantly decreased in treatment naïve patients compared to healthy controls ($p=0.01$) ($p<0.01$). Post IVIg levels of FcγRs were downregulated in patients as compared to pre IVIg values. On further analysis, between IVIg responders and IVIg resistant KD, 2 patients with IVIg resistance showed low surface expression of FcγRII [1.89%; 0.49%] compared to responders [98.49%; 98.53%] on neutrophils. Loss of inhibitory signals of FcγRII has been associated with dysregulated antibody function. Thus, suggesting role of IVIg in modulation of expression of FcγRs. Conclusions: Expression of FcγRs differs in IVIg responders compared to IVIg resistant patients with KD suggesting its association with IVIg resistance. A better understanding of these pathways is likely to open up better therapeutic options in patients with KD especially IVIg resistance.

OP24. DECIPHERING THE MOLECULAR LANDSCAPE OF MITOCHONDRIAL DNA DEPLETION SYNDROMES: A CASE SERIES

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ABSTRACT

Background: Mitochondrial DNA (mtDNA) depletion syndromes (MDDS) are genetically and clinically varied autosomal recessive disorders characterized by reduced mitochondrial DNA content in cells. A subtype of MDDS is linked to deficiency in the mitochondrial succinyl-CoA ligase enzyme due to pathogenic mutation in the *SUCLG1* gene. Methods: The retrospective descriptive study was conducted in the Pediatric Neurology unit of a tertiary care hospital. Case records were reviewed and the data regarding the presentation, family history, biochemical profile, radiological features, and molecular genetic studies was collected. Results: We report 3 cases with *SUCLG1* gene mutation. The mean age of presentation was 4.6 months (range 3-6 months). The age of onset of symptoms was six months in all cases. The common clinical presentations were global developmental delay (100%), generalized dystonia (100%), and impaired vision (33.3%). There was no history of seizures in any case. Biochemical analysis revealed high levels of urine methylmalonic acid (MMA), plasma lactate, and methyl malonyl carnitine in all cases. Brain magnetic resonance imaging showed symmetrical altered SI areas in bilateral basal ganglia, periventricular areas and atrophy of bilateral corpus striatum. Genetic analysis identified a common novel homozygous missense variant (c.358G>C; p.Val120Leu) in *SUCLG1* gene. The *in-silico* prediction of the variant was deleterious. Conclusion: The diagnosis of mitochondrial disorders with diverse phenotype has always been challenging. MDDS associated with *SUCLG1* gene can be detected biochemically by elevated plasma lactate and methylmalonic acid. Mass spectrometry-based analysis of the metabolites may potentially reduce the time to diagnosis and management.

OP25. POTENTIAL APPLICATIONS OF IMMOBILIZED FUNGAL KERATINASE IN LAUNDRY AND LEATHER INDUSTRY

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ABSTRACT

Chicken feathers are a keratin-rich waste of the poultry industry and a big concern for a clean environment due to their complexity, energetically demanding molecular structure, and mounting quantity at the industrial scale with each passing day. Direct disposal and physico-chemical degradation are neither cost-effective nor environment-friendly. However, keratinolytic microbes pave the way to solve this problem. In the present study, keratinase produced from *Aspergillus gorakhpurensis* was immobilized by physical adsorption, entrapment, and covalent binding. Free and immobilized enzyme was investigated for its

activity against chicken feathers at a pH range of 3.5-9.5 and temperature range of 25-95ºC. Keratinase degraded a range of keratin-rich wastes such as chicken feathers, pigeon feathers, hairs, nails, hoofs, horns, egg albumin, etc. Enzyme displayed optimal activity in the pH range 6.5-9.5 and temperature of 45-65ºC. Moreover, the potential removal of the stains from cloth and dehairing of goat skin was also studied. Free and immobilized keratinase (1235 U) efficiently removed the stains of blood, ketchup, egg albumin, and chocolate after 30 minutes of incubation freely and in combination with chemical detergents. The enzyme effectively removed the hairs from goat skin within 2 hours of incubation, without damaging the surface and grain structure assuring its application as a promising alternative to chemical treatment to the leather industry. Therefore, keratinase from *Aspergillus gorakhpurensis* displayed remarkable potential for the application for stain removal in laundry and dehairing of goat skin for the leather industry, indicating the opportunity for sustainable waste management and potential applications.

OP26. A KAP STUDY TO ASSESS AWARENESS ABOUT EYE FLU (CONJUNCTIVITIS) AS A PUBLIC HEALTH PROBLEM AMONG MEDICAL STUDENTS

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ABSTRACT

Conjunctivitis refers to inflammation of conjunctiva that covers the sclera and inside of eyelid. It is also known as Pink eye as it causes pink or red coloration of eye. This condition is caused by a group of adenovirus family which are highly contagious and spread quickly. The monsoon season is the ideal time for viruses and bacteria to multiply due to heat, humidity and waterlogging, the viral conjunctivitis outbreak this time is considerably worse than in past years. Improving public awareness about eye flu is necessary in order to eliminate the spread of the disease including the preventive measures such as strict personal hygiene (washing hands, avoid touching eyes, face) isolating infected cases and avoiding public places. OBJECTIVE- To assess knowledge of conjunctivitis and their determinants among medical students. METHOD- A cross sectional descriptive study design was carried out in August-September. Data were collected through a self-report questionnaire including demographic data and question regarding knowledge of causes of conjunctivitis and it's sign and symptoms.

OP27. STRING AND HADDOCK -ASSISTED INTERACTIVE NETWORK PREDICTION FOR VIRULENCE EFFECTOR MOLECULES OF SALMONELLA

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ABSTRACT

A biosafety risk level II bacteria, *Salmonella enterica*, causes enteric infections in humans and animals. Its virulence mechanism mainly involves T3SS (type III secretion system) and effector molecules. Effector molecules are distinctive proteins that facilitate invasion and persistence of the bacteria in the host cells and support pathogenicity. While exploring the effector molecules which contribute for sustenance of bacteria in the host it was observed that SifA; SifB (*Salmonella* induced filaments Sif -A & -B), SseK, SseJ, GtgE, CigR, SopD, Rab7, Rab32 and RILP are the key players. Therefore, the present study was designed to analyze the mutual interaction of these effectors through STRING-DB search and HADDOCK. Firstly, STRING-DB search resulted into seven major interacting edges with significant confidence score (> 0.5) and text mining, co-expression and experimentally determined evidences. The associations between SseK-SifB (0.50), SifB-SseJ (0.982), SifA-SifB (0.576), SifA-CigR (0.677), CigR-GtgE (0.70) are specific and meaningful, i.e., proteins jointly contribute to a shared function of virulence. All of these protein sets were verified with HADDOCK and they exhibited significant score with iRMSD < 2.5. The most favorable interaction was found between SifA-SifB with HADDOCK score (-99.5) & iRMSD value 1.5. The interacting amino acids displayed by SifA-SifB pair includes 72-TYR & 74-ALA, 87-HIS & 272-PHE, 152-GLU & 272-PHE, 153-PRO & 284-GLN, 175-ASP & 260-LYS. These findings clarify that *Salmonella* virulence effectors function in an integrative network and put concerted effort to manipulate the host's machinery and evade their immune response. Our work delivers new computational insights into *Salmonella* pathogenicity.

OP28. GREEN SYNTHESIZED SILVER-GRAPHENE DERIVATIVES-BASED NANOCOMPOSITES: PREPARATION, ITS ANTIFUNGAL POTENTIAL AND ITS BIOMEDICAL APPLICATIONS

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ABSTRACT

Candida auris is a multidrug resistant rapidly emerging fungal pathogen, with high mortality rates and with the ability to colonise skin leading to wound infections and hospital-acquired bloodstream infections. The tendency of *Candida auris* to colonize skin is worrisome due to pathogen's ability to persist in the environment and on medical devices. Thus, safeguarding these material surfaces from microbial attachment and its biofilm formation continues to pose a substantial challenge. An increasing awareness towards green chemistry and utilization of green route by plant extracts for production of silver nanoparticles led to develop eco-friendly methods for the treatment of fungal infections. Furthermore, the healthcare industry is highly

interested in the application of antimicrobial coatings on biomedical devices to prevent microbial colonization. In this context, graphene nanomaterial, a versatile compound with exceptional properties, has created an excellent opportunity in the field of biology and biomedical research. It offers a combination of impressive surface area, high strength, thermal and electrical properties, and a wide array of functionalization possibilities. In this study, nanohybrid derivatives of silver graphene were produced and employed as antimicrobial coatings. Overall, the study is aimed to emphasize the potential of graphene-based materials, especially when functionalized with silver nanoparticles, by addressing both their current comprehension and the knowledge gap regarding their antimicrobial properties and biocompatibility. Further, the research aims to explore the applicability of these materials as wound bandages to mitigate fungal infections.

OP29. BENEFITS OF NEEM IN GYNECOLOGICAL CANCER

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ABSTRACT

The recent studies of nutraceuticals present in Neem which acts as reservoirs of therapeutic compounds of several diseases including gynecological cancer. Five main types of cancer affect a women's reproductive organs are cervical, ovarian, uterine, vaginal, and vulvar. A 6th type of cancer is very rare fallopian tube cancer. Ovarian and cervical cancers are the most common gynecological cancers affecting women worldwide and in India. Compounds present in bark, leaves flowers and seed oil shows properties such as chemo-preventive capacity, apoptotic activities, immune modulatory effects and induction of p53 independent apoptosis. Methanolic neem (*Azadirachta indica*) stem bark extract induces cell cycle arrest, apoptosis and inhibits the migration of cervical cancer cells in vitro. Recent studies showed that neem leaf extract is able to induce apoptosis in the MCF-7 breast cancer cellular line. This discovery of phytochemicals (neem extracts or neem compounds) as therapeutic agents will be useful.

OP30. DATA AND PRIVACY: AN IGNORED SUBJECT

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ABSTRACT

As data is new gold, knowledge of the changing patterns in crime due to emerging technologies and how the technology is misused by the criminals for their own benefit and affecting the peace and security of the society is important. Identity theft, sexual harassment, ransomware, blackmailing, financial loot and many more are in long list of such crimes. Young minds are attracted and misled by the internet. Nothing is entirely secured in this era of the internet unless there is upright cybersecurity. INTRODUCTION "Change is the law of nature." In today's fast-growing world, advancement in technology is necessary to change the way we live and will continue to change in future. As a result, everything is emerging at a faster pace. But everything which has a positive impact also has its dark side as well. Its negative impact is that it has a major contribution in growing cybercrimes which is a concern.

Because of the internet all the information is just a click away. It's important to inform people about their data privacy because criminals always take advantage of this information available over the internet to commit illegal acts. Most of the time victims are not aware of the extent to which they got victimized.

OP31. ASSESSMENT OF PLANT GROWTH PROMOTING RHIZOBACTERIA FOR THE IMPROVED GROWTH AND NUTRITIONAL CONTENT OF GROUNDNUT

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ABSTRACT

The groundnut is a vital economic crop globally, providing a crucial source of edible oil and protein-rich food. Due to the environmental pollution and fluctuating prices of chemical fertilizers, it has become important to find out cost-effective and eco-friendly agricultural practices to improve crop productivity in a sustainable manner. Plant growth-promoting rhizobacteria (PGPR) have a huge potential in improving the soil health, plant growth and yield. In the present study, a total of 20 morphologically distinct rhizobacterial strains were isolated from the groundnut growing in the fields of Punjab Agricultural University, Ludhiana, and village Badla, Hoshiarpur. The isolates exhibited multifarious plant growth promoting traits like phosphate and zinc solubilization, and production of auxins, siderophores and ammonia. The phosphate solubilization in liquid medium varied from 22.3 to 156.7 µg/ml after 5 days while the auxin production ranged from 16.0 to 66.4 µg/ml after 48 h by the isolates. Four potential bacteria showing multiple traits also exhibited robust growth on nitrogen-free media and were identified as *Bacillus aryabhattai*, *Pseudomonas extremorientalis*, *Alcaligenes faecalis* and *Klebsiella oxytoca*. These bacteria significantly improved the plant growth, chlorophyll content, nodulation, and N, P, and K content in both plant and soil samples compared to the uninoculated control in pot experiment conducted under greenhouse conditions. These findings highlight the potential of these bacterial strains for promoting groundnut growth and nutrient content under Punjab conditions.

OP32. MYCOTOXINS: THE HIDDEN DANGER IN FOOD

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ABSTRACT

Mycotoxins are secondary metabolites produced by fungi and are capable of causing various diseases in humans and animals. They are naturally occurring chemical substances and are chemically stable which is why they pose a great threat to public health. Accumulation of mycotoxins in the food chain can cause hazardous effects in humans. The gut microbiota has a bidirectional relationship with mycotoxin, being the leading cause of the development of mycotoxicosis. Preventive measures for controlling contamination should be adopted both before and after harvest. Mycotoxins are naturally occurring, low molecular weight,

chemically stable secondary metabolites produced by fungi like Aspergillus, Fusarium, Penicillium species and are the cause of adverse health effects in humans and animals, leading to mycotoxicosis. They grow on various crops including cereals, nuts, spices and coffee beans, apples under warm and humid conditions. Mycotoxins are exotoxins that are produced when fungal growth ceases due to nutrient limitations and the presence of excess carbon sources. Occurrence of mycotoxins in food poses great threat to the consumers and is considered to be one of the major global health issues.

OP33. UNRAVELING MOLECULAR PATHWAYS AND THERAPEUTIC TARGETS IN ADPKD ASSOCIATED CKD AND ESRD

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ABSTRACT

Autosomal Dominant Polycystic Kidney Disease (ADPKD) is a prevalent hereditary kidney disorder that often progresses to chronic kidney disease (CKD) and end-stage renal disease (ESRD), posing a significant healthcare burden. This study aimed to illuminate the intricate molecular mechanisms underlying ADPKD-associated CKD and ESRD, with a focus on identifying potential therapeutic biomarkers. Using miRNA expression profiles from ADPKD patients and controls, we uncovered 79 and 36 differentially expressed miRNAs (DEmiRs) in ADPKD-CKD (Group A) and ADPKD-ESRD (Group B), respectively. Further analysis unveiled 83 top target genes in Group A and 76 in Group B, with an emphasis on pathways such as hepatic fibrosis signaling and estrogen receptor signaling. Remarkably, we identified six promising therapeutic targets in Group A (*MAP2K1*, *RAF1*, *TGFBR2*, *CCND1*, BCL2, and MAPK14) and four in Group B (CCND1, MYC, BCL2, and MAPK14). Molecular docking studies demonstrated the potential of drugs like Paclitaxel, Encorafenib, and Sorafenib to effectively target these genes. Our findings provide valuable insights into the molecular landscape of ADPKD progression and offer a foundation for future therapeutic development, bringing us closer to improved treatments for this debilitating condition.

OP34. IDENTIFYING BIOMOLECULAR SIGNATURES FOR DIABETIC NEPHROPATHY AND MEMBRANOUS NEPHROPATHY: A COMPARATIVE BIOINFORMATICS ANALYSIS

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ABSTRACT

Diabetic Nephropathy (DN) and Membranous Nephropathy (MN) are two kidney diseases differing in aetiology but manifesting similar characteristics. To establish the demarcation as

well as the congruity between DN and MN, the study employed a comprehensive bioinformatics framework to identify the hallmarks, potential therapeutic biomarkers and drugs for both diseases. Retrieved dataset GSE51674 provided miRNA profiles for 4 normal kidney samples, 6 DN samples and 6 MN samples, identified in patients with Type 2 Diabetes Mellitus (T2DM). This data was subjected to statistical analysis in RStudio and extensive enrichment analysis in Qiagen IPA, followed by drug repurposing via molecular docking in Schrödinger. The analysis mapped typical hallmarks including angiogenesis, immune response, proliferation, apoptosis and inflammation and atypical hallmarks viz. fibrosis, podocyte injury, insulin regulation and response to glucose levels, glomerulosclerosis and proteinuria. As per maximal involvement in hallmarks and top pathways, prime miRNAs discerned were miR-31-3p, miR-199a-3p, miR-2682-5p and miR-193a-5p for DN and miR-30c-1-3p, miR-423-3p, miR-129-1-3p and miR-124-3p for MN. Top therapeutic targets belonging to MAPK, PIK, AKT and RAS families were construed. MTOR, JUN and AGTR1 were envisioned as potential therapeutic biomarkers of DN and RALB, SMO and GSK3B of MN. Hereupon, PIK3C2A appeared as a highly probable therapeutic target for both DN and MN where Aspirin can be repurposed. This set a precedent for further in-silico and wet-lab investigations, especially by exploring urinary exosomes, to enhance the clinical strategies of DN and MN.

OP35. EXPLORING MOLECULAR BIOMARKERS FOR PROGNOSIS IN PAPILLARY RENAL CELL CARCINOMA: A BIOINFORMATICS APPROACH

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ABSTRACT

(Batch: 2021-23) Papillary Renal Cell Carcinoma (PRCC), a subtype of kidney cancer, poses significant challenges due to limited treatment options and a poor prognosis. This study utilizes an *In Silico* approach to uncover potential prognostic biomarkers and key pathways associated with PRCC. RNA-Seq data from 322 patients diagnosed with Kidney Renal Papillary Cell Carcinoma (KIRP) were analyzed to identify differential gene expression patterns using RStudio. The analysis involved pathway enrichment and pathway connector gene identification using Ingenuity Pathway Core Analysis, shedding light on the specific biological processes and regulatory networks in PRCC. A Kaplan-Meier survival analysis assessed the prognostic value of these pathway connector genes. The analysis identified 132 upregulated and 1,085 downregulated genes pivotal in cancer development. These were associated with 20 differentially regulated pathways in KIRP, offering potential therapeutic targets and insights into disease mechanisms. Pathway connector genes, crucial in coordinating and maneuvering biological processes, were identified. Kaplan-Meier survival analysis highlighted the potential prognostic significance of specific pathway connector genes, particularly ADRA2C and CHRM1.These genes hold promise for personalized treatment approaches in PRCC. While further validation and functional studies are necessary, this study

underscores the importance of bioinformatics tools in biomarker discovery and pathway elucidation. It contributes to cancer research knowledge and the potential for precision medicine in managing PRCC.

OP36. TRANSXPLORER: A BIOINFORMATICS-BASED TOOL FOR NAVIGATING RNA-SEQ INSIGHTS WITH EASE

Varinder Madhav Verma[1], Sanjeev Puri[2], Veena Puri[1]

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ABSTRACT

RNA sequencing (RNA-seq) is a transformative method for understanding gene expression and regulation at the transcriptome level, shedding light on intricate molecular processes and diseases. Yet, the complexity of RNA-seq analysis often deters researchers who lack computational expertise. This gap is addressed by TransXplorer, an intuitive RNA-seq data analysis tool developed using the R shiny package. TransXplorer offers a first-of-its-kind, web-based interface for thorough, robust, and seamless analysis. Notably, the tool integrates a module for TCGA RNA-seq data analysis, providing swift access to other expansive transcriptomic datasets. It empowers users to conduct significant functions with ease viz. differential gene expression analysis (DEG), principal component analysis (PCA), and uniform manifold approximation and projection (UMAP) – all within a single window frame. By interfacing seamlessly with TCGA, users rapidly extract, analyze, and visualize pertinent gene expression patterns. TransXplorer transcends gene-level scrutiny, offering Gene Enrichment Analysis. Users can input a list of genes and perform gene ontology (GO) analysis and Kyoto Encyclopedia of Genes and Genomes (KEGG) pathway enrichment analysis to identify the biological functions and pathways associated with the genes. TransXplorer excels by analyzing RNA-seq data from public repositories like GEO and Array Express. Also, TCGA dataset import and its analysis make this a novel tool. Various datasets from GEO and TCGA have been analyzed using the TransXplorer, giving us accurate results. Unlike other tools, TransXplorer's comprehensive approach makes RNA-seq analysis accessible even to non-bioinformatics researchers, setting it apart as a powerful solution for insightful transcriptomic exploration.

OP37. ENHANCEMENT OF BIOGAS PRODUCTION FROM SWEET SORGHUM STALKS USING MICROBIAL INTERVENTIONS

Yashika Aggarwal[1], Urmila Gupta Phutela[2]

[1]*Department of Microbiology, Punjab Agricultural University, Ludhiana,* [2] *Department of Renewable Energy Engineering, Punjab Agricultural University, Ludhiana*

ABSTRACT

Biogas a renewable energy source, is generated through anaerobic digestion and employs diverse forms of biomass as inputs, such as animal byproducts, agricultural wastes and algae etc. Sweet sorghum, a major cereal crop, is generally regarded as a favorable substrate for the

generation of biofuel due to its balanced composition of both soluble and insoluble carbohydrates. Sweet sorghum stalks are made up of lignin (21.39%), cellulose (14.72%), hemicellulose (34.09%), and other materials. The digestibility of sweet sorghum stalk is quite low due to its high lignin content, cellulose crystallinity, degree of polymerization etc. Hence, co-digestion/ pretreatment of sweet sorghum stalks is required to improve cellulose permeability to microbial or enzymatic assaults. The present study was carried out to enhance the biogas production using various microorganisms/ microbial consortium such as Rhizobium culture, bio-digested slurry, microalgae powder and bio-enzyme. The co-digested/ pretreated feedstock was employed in 2-litre capacity biogas digesters and amount of biogas was measured by water displacement method. The outcomes revealed that the most substantial enhancement of 15% in biogas production occurred when 20% Rhizobium culture was utilized. Additionally, a 10% increase was observed when sweet sorghum was co-digested with paddy straw.

ABSTRACTS OF POSTER PRESENTATIONS

PARTICIPANTS

S. No.	Name of participant	Affiliating institution	Title of abstract
1.	Kajol Verma	VRDL, Deptt. Of Microbiology, BPS Govt. Medical College for Women, Khanpur Kalan, Sonepat, Haryana, India	Prevalence of dengue fever at a tertiary care centre
2.	Amandeep Kaur	Department of Biochemistry, Panjab University Chandigarh	Exploring the impact of ethanol on Saccharomyces cerevisiae and Wickerhamomyces anomalus: Insights into adaptive response
3.	Aniqa	Department of Biophysics, Panjab University, Chandigarh	Murraya koenigii targets RAS/MAPK pathway to suppress skin carcinoma
4.	Ankush Jain	Department of biotechnology, Panjab university, Chandigarh	Heterologous expression of nattokinase in E. coli
5.	Ayushi Raturi	IISER, Mohali	Role of endogenous CRISPR-CAS system in Salmonella pathogenesis
6.	Bharti	Department of Biotechnology, Panjab University, Chandigarh and CSIR-IMTECH, Sector 39-A, Chandigarh	Dual-functional probe approach for rapid colorimetric sensing of heart failure
7.	Bishakha Thakur	Department of Microbiology, Panjab University, Chandigarh	Integrated bioconversion of food waste residues into enzyme formulations and ethanol
8.	Chamjailiu Daimai	IISER, Mohali	Deciphering the multifaceted effects of Salmonella infection on Caenorhabditis elegans development
9.	Harpreet Kaur	Post Graduate Institute of Medical Education and Research, Chandigarh, India	Identification and characterization of putative drug targets in uropathogenic Escherichia coli by

			protein-protein interaction network analysis: In silico approach
10.	Esha Chander	Department of Biophysics, Panjab University, Chandigarh	Study to delineate the alleviating impact of Murraya koenigii silver nanoparticles on high fat diet induced hypercholesterolemia against testicular dysfunctioning
11.	Gagandeep Kaur	Department of Biotechnology, BMS BLOCK 1, South Campus, Panjab University, Chandigarh, 160014, India	Active site amino acid residue mutation enhances plasminogen activation potential of streptokinase
12.	Jasdeep Kaur	Department of Microbial Biotechnology, Panjab University, Chandigarh	Establishment of a murine model of Rhino-Orbito-Cerebral mucormycosis
13.	Mandeep Kaur	Department of Biophysics, Panjab University, Chandigarh 160014, India	CLP1, an overexpressed subunit of CF IA and critical insights into its molecular interaction with SSU72 via computational and biophysical approaches
14.	Mayank Maan	Department of Biophysics, Panjab University, Sector 25, Chandigarh, India	Template-based design and characterization of terminally modified and d-amino acid substituted synthetic peptides
15.	Mridul Sharma	Center for Stem Cell Tissue Engineering and Biomedical Sciences, Panjab University, Chandigarh	Renal cancer stem cells: Characterization and targeted biomarkers
16.	Nandni Goyal	Department of Biotechnology, Panjab University, Chandigarh	Genome wide identification and in-silico expression profiling of BTB gene family in grapes (Vitis vinifera L.)

17.	Nisha Beniwal	Department of Medical Microbiology, Regional Medical Research Centre, Port Blair, Andaman and Nicobar Islands	Burden of acute viral blepharoconjunctivitis in Andaman islands, India
18.	Nivedita Sharma	Department of Biophysics, Panjab University, Chandigarh	Development of chemically induced breast tumor model in female SD rats: Stages of tumorigenesis
19.	Rinku Balhara	Department of Biotechnology, Panjab University, Chandigarh	Genome-wide identification and expression analysis of the MYB transcription factor (TF) family in response to drought conditions in Brassica juncea
20.	Rishika Rohilla	Department of Biochemistry, Panjab University, Chandigarh 160014, India	Flower-shaped PEDOT augmented Ag_2MoO_4 NPs for electrochemical detection of holotranscobalamin (holoTC)
21.	Sandeep Saini	Department of Biophysics, Panjab University, Sector 25, Chandigarh 160014, India	In silico analysis of genomic landscape of SARS-COV-2 and its variant of concerns (Delta and Omicron) reveals changes in the coding potential of miRNAs and their target genes
22.	Saurabh Kumar	CCRYN- Collaborative Centre for Mind Body Intervention through Yoga, Post Graduate Institute of Medical Education and Research (PGIMER), Chandigarh	Exploring the effectiveness of yoga: Neuropsychology and biochemical insights
23.	Shamli	Department of Biophysics, Panjab University, Chandigarh	Efficacy of antimicrobial coatings against catheter associated urinary tract infection(s)

24.	Shilpa	Department of Biophysics, Panjab University, Chandigarh, India	Anti-cancer potential of hydroethanolic Murraya koenigii leaves extract against 7,12-dimethylbenz[a]anthracene-induced breast carcinogenesis in rats
25.	Shiv Nandan Sah	Department of Microbiology, Panjab University, Chandigarh, India	In silico design of multi-epitope peptide vaccine against Acinetobacter baumannii
26.	Shivani Sharma	Department of Biophysics, Panjab University, Chandigarh	Therapeutic efficacy of human Defensin-5 against Murine salmonellosis
27.	Sonia Rani	Department of Biochemistry, Panjab University, Chandigarh, 160014, India	Development of electrochemical biosensor for Alzheimer
28.	Sukhwinder Singh	Department of Biochemistry, Panjab University, Chandigarh	Improving tolerance of Saccharomyces cerevisiae against furfural through adaptive laboratory evolution
29.	Sunena Jassal	Department of Microbiology Panjab University, Chandigarh	Isolation and application of a bacterial laccase for eco-friendly dye decolourization and denim bleaching
30.	Swati Sihag	Department cum National Centre for Human Genome Studies and Research, Panjab University	Exploring the potential of bacteroidetes for bioactive natural products
31.	Vinayak Sharma	Department of Biotechnology, Panjab University, Chandigarh	Investigation of in-vitro anti-cancer and apoptotic potential of orange-derived nanovesicles against breast cancer cell lines
32.	Vipasha Thakur	Department of Biotechnology, Panjab University, Chandigarh	Antibiofilm potential of a novel antimicrobial peptide with conventional antibiotics

			against MDR Klebsiella pneumoniae
33.	Aaryan Jaitly	GGDSD College, Sector 32-C, Chandigarh	RNA-Seq data assembly and analysis identified differentially expressed genes in the lesion and non-lesion skin of individuals with vitiligo
34.	Abhishek	Centre for Stem Cell Tissue Engineering & Biomedical Excellence, Panjab University, Chandigarh, 160014	Anticancerous potential of fermented beverage infused with panicle of Pennisetum glaucum extract against MCF-7 cell line
35.	Ankush, Samridhi	Center of Public Health, Panjab University, Chandigarh	The impact of millet-based diets on anaemia prevalence in populations at high risk
36.	Hargunjeet Kaur	Department of Bioinformatics, GGDSD College, Sector-32 C, Chandigarh	Comparative exome analysis of PANC-1, HPAC and MIAPaCa-2 cell lines to identify highly deleterious non-synonymous single nucleotide polymorphisms (NSSNPS) associated with pancreatic ductal adenocarcinoma
37.	Jessica Dhillon	Department of bioinformatics, GGDSD college, Chandigarh	Comparative transcriptomic analysis identifies PTPRC and IL7R as key genes in psoriasis and atopic dermatitis
38.	Kanika Thakur	Department of Bioinformatics, Goswami Ganesh Dutta Sanatan Dharma College, Sector 32-C, Chandigarh	In silico functional annotation of hypothetical proteins associated with pathogenicity islands of Salmonella enterica
39.	Malhaar Sidhu	Centre for Stem Cell Tissue Engineering and Biomedical	Stem cell based novel cancer therapies: Filling

		Excellence, Panjab University, Chandigarh	gaps in transitioning phase of oncology
40.	Megha Jaswal	Department of Biotechnology and Food Technology, Punjabi University, Patiala	Gene expression of PKC-Δ in neuropathic pain: A molecular, behavioral and computational study
41.	Muskan	Centre for Systems Biology and Bioinformatics (U.I.E.A.S.T.), Panjab University, Chandigarh, India	A network system biology and bioinformatics approach to identify molecular pathogenesis of osteoporosis with type 2 diabetes and cardiovascular disease
42.	Palak Sidana	Department of Biophysics, BMS Block II, South Campus, Panjab University, Chandigarh	Role of host defence peptides in tumor-microenvironment
43.	Radhika Dhawan	Department of Microbiology, Punjab Agricultural University, Ludhiana	Evaluation of different edible coatings for quality maintenance of freshcut carrot
44.	Rajni Goyal	Department of Microbiology, Punjab Agricultural University, Ludhiana	Comparative study of fermentation efficiency of microbial isolates for type II Sourdough production
45.	Sanghvi	Centre for Stem Cell Tissue Engineering and Biomedical Excellence, Panjab University, Chandigarh	Invasive role of cancer stem cells in head and neck cancer
46.	Tuhin Mallick	Department of Biophysics, Basic Medical Sciences Block II, Panjab University South Campus, Chandigarh, 160014	Aloe vera confers protection against chromium induced damage in hepatic and renal tissues of mice

PP1. PREVALENCE OF DENGUE FEVER AT A TERTIARY CARE CENTRE

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ABSTRACT

Dengue is a vector-borne disease caused by a RNA virus of the *flaviviridae* family. It has emerged as a significant threat and burden to public health systems in tropical and sub-tropical regions. The present study aims to evaluate the prevalence of dengue fever among clinically suspected patients at a tertiary care centre. This study was conducted in Bhagat Phool Singh Govt. Medical College for Women, Khanpur Kalan, Sonepat from September 2015 to November 2021. Serum samples from clinically suspected cases of dengue were tested by IgM capture ELISA and NS1 ELISA. A total of 4,435 samples were found to be positive for dengue. Out of total, 2,754(62%) were males and 1,681(38%) were females. The most common affected age group was 21-30 years. Anti-dengue IgM antibody were detected in 503 cases whereas NS1 antigen was present in 3,893 cases. 39 cases were found to be reactive for both IgM antibody and NS1 antigen. The seroprevalence was higher in monsoon with maximum rate of positivity in September and October. The prevalence of dengue infection being critical indicates the importance of detection of both IgM antibody and NS1 antigen for diagnosis of dengue infection. Dengue has emerged as a public health concern in developing countries like India, the prevalence in a particular geographical area is needed for acceleration of appropriate vector control measures to reduce the morbidity and mortality associated with the disease.

PP2. EXPLORING THE IMPACT OF ETHANOL ON SACCHAROMYCES CEREVISIAE AND WICKERHAMOMYCES ANOMALUS: INSIGHTS INTO ADAPTIVE RESPONSE

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ABSTRACT

The global drive towards environmental conservation has intensified the pursuit for sustainable energy solutions. Biofuels, particularly bioethanol, has come to the forefront as promising alternatives to traditional fossil fuels, offering benefits such as reduced greenhouse gas emissions, compatibility with current combustion engine designs, and decreased dependency on non-renewable energy sources. Despite these benefits, the industrial-scale production of bioethanol remains challenging. One major obstacle is the intrinsic toxicity of ethanol, which has detrimental effects on yeast strains during fermentation process. This toxicity can cause significant disruptions, such as inhibiting yeast growth, reducing viability, and even leading to cell death, thereby affecting overall fermentation efficiency. Therefore, yeast strains that can withstand high ethanol concentrations are highly desirable. To address this pressing concern, the present study was designed to improve the ethanol tolerance in

conventional yeast *Saccharomyces cerevisiae* and pentose fermenting non-conventional yeast *Wickerhamomyces anomalus* by supplementation of Vitamin E in order to mitigate the adverse effects of ethanol to improve the fermentation efficiency. Our preliminary results suggest that Vitamin E supplementation significantly enhances ethanol tolerance, promoting cell growth and viability under high ethanol conditions (10% and 12% ethanol). This protective role of vitamin E is attributed to its ability to preserve membrane integrity, counteract lipid peroxidation, and adjust fatty acid composition, ensuring optimal membrane fluidity during ethanol stress. This consequently elevates cell viability, leading to superior ethanol tolerance in both the strains. The correlation between vitamin E levels and enhanced cell viability is thus pivotal in this study.

PP3. MURRAYA KOENIGII TARGETS RAS/MAPK PATHWAY TO SUPPRESS SKIN CARCINOMA

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ABSTRACT

Cutaneous squamous cell carcinoma (CSCC) is the most common type of non-melanoma skin cancer (NMSC). Despite the advancements in the therapeutic strategy of CSCC, the outcome of patients with metastatic CSCC is still dismal. Gastrointestinal and kidney disorders, bone marrow suppression, fatigue, and cancer cell resistance can be seen with chemotherapy. For these reasons, chemoprevention with low toxicity is among researchers' priorities. So, the present study aims to explore the effect of *Murraya koenigii* leaf extract on signaling pathways involved in skin carcinogenesis. The study segregated male LACA mice into Control, HEMKLE, DMBA/TPA, and HEMKLE+DMBA/TPA. After 22 weeks, skin tissues/tumors were extracted and utilized for various estimations, viz., estimations of glycolytic pathway enzymes, gene and protein expressions of cell-proliferation associated markers, and MAPK pathway markers. Results showed that DMBA/TPA treatment caused a shift of cancer cells to glycolysis for cell proliferation, which was further confirmed by analysis of P53, P21, PCNA, CREB-1, Cyclin D1, and the MAPK pathway, viz., JNK, ERK, and p38. However, HEMKLE pre-treatment caused a significant decrease in glycolysis, thus halting cell proliferation and tumor promotion. Oral HEMKLE administration emerges as a promising chemo-preventive intervention, exerting anti-promotion influences on skin carcinogenesis. Nonetheless, further investigations are imperative to unravel its underlying mechanisms comprehensively.

PP4. HETEROLOGOUS EXPRESSION OF NATTOKINASE IN E. COLI

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ABSTRACT

Nattokinase also known as subtilisin NAT or NK is a potent bacterial serine protease that exhibits strong fibrinolytic activity. NK is mainly extracted from Natto, a fermented soybean product. However, the downstream extraction and purification processes for obtaining NK

from natto slurry are difficult and inefficient in comparison to that of a simple fermentation process. The presence of various contaminants and vitamin K are major impediments being observed very often. The costly and complicated extraction and purification processes have restricted the general use of NK as a drug. Although capsules containing NK as the main ingredient have been produced, their application is limited due to short supply, impurity, and high production cost. In addition, most of the extracellular native proteins produced by Bacillus are degraded by their own proteases. To overcome these problems, in the present study, the attention was focused on producing it as a recombinant protein in *E. coli*. The NK encoding gene was successfully cloned into the pET28a expression vector and subsequent protein expression was validated in BL21 C41 (DE3) cells. The protein was subsequently purified and refolded from inclusion bodies. Concurrently, mutants were constructed by direct evolution approach to enhance their fibrinolytic activity.

PP5. ROLE OF ENDOGENOUS CRISPR-CAS SYSTEM IN SALMONELLA PATHOGENESIS

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ABSTRACT

Typhoid fever caused by pathogen *Salmonella* Typhi has been a consistent threat to human population around the globe with its cases rising each year worldwide. The CRISPR-Cas (Clustered Regularly Interspaced Short Palindromic Repeats) system in bacteria form of adaptive immunity against invading foreign pathogens, but recent studies have highlighted its role in the ability of the organism to infect the host and cause a disease. The CRISPR-Cas system of *S. Typhi* consists of CRISPR-I, CRISPR-II and Cas array in its genome, which we hypothesize, may be playing significant role in infection potential of bacteria. Out of the cas genes array, *cas3* gene is a major player in regulating pathogenesis as encode for Cas3 which acts as an endonuclease that chops off the foreign genetic material, working in cohesion with the crispr RNA. In this ongoing study, we are analyzing the role of this system in regulating the infection dynamics of bacteria using various epithelial and macrophage like cell line models. We used mutant strains of CRISPR-I array, CRISPR-2 array and *cas3* gene to infect various cell line models to observe the changes in the invasion/internalization ability of bacteria and its proliferation inside the cell. We observed that mutants were compromised in invasion and intracellular survival as well, when compared with wild type. As this system can prove to be a potential target for creating novel approaches against Typhoid, we further wish to unveil the molecular mechanism of the CRISPR-Cas mediated regulation of virulence genes in *S. Typhi* pathogenesis.

PP6. DUAL-FUNCTIONAL PROBE APPROACH FOR RAPID COLORIMETRIC SENSING OF HEART FAILURE

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ABSTRACT

Herein, we develop dual-functional nanobioprobe-based sensing platform that gives colorimetric results within 15 minutes. The assay is based on a novel nanobioprobe that detect specific biomarker of heart failure in the sample. The spotlight of assay is the design of high-affinity nanobioprobe with dual functional bioreceptors on the surface of nanoparticles, thus making it a useful sensing tool. The detection method uses metal nanoparticles-enzyme interplay-based concept that gives colorimetric output. The presence of linear biomarker i.e., NT-proBNP in the sample creates a shielding barrier over dual-functional nanobioprobe rendering the enzyme free in the solution. The active enzyme reaction generates a pink-colored product that enables visual detection. On the other hand, in the absence of biomarker, nanobioprobe inhibits the activity of free enzyme in solution and the color remains yellow. As a result, the enzyme's activity generates a pink color warning as an endpoint indicating the presence of a specific biomarker. The assay utilizes cost-effective components that prevail as an attractive option for point-of-care applications in developing nations and it has also overcome the limitations associated with conventional ELISA assay.

PP7. INTEGRATED BIOCONVERSION OF FOOD WASTE RESIDUES INTO ENZYME FORMULATIONS AND ETHANOL

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ABSTRACT

This study explores the integrated bioconversion of food waste residues into enzyme formulations and ethanol for sustainable waste management and biofuel production. Quantitative analysis of the residues revealed high carbohydrate content, particularly cellulose and starch. Various food waste residues were assessed for supporting the growth of *Aspergillus niger* S-30 and multiple enzymes production and proved to induce the production of different enzymes, emphasizing their potential as substrates. The study developed stable liquid and solid enzyme formulations from *Aspergillus niger* S-30 cultures on food waste biomass. These formulations comprising complete cellulase hemicellulase, amylase and pectinase systems along with inulinase, protease, lipase and alginate lyase, demonstrated consistent enzyme activities even after one month of storage at room temperature. The concentrated liquid and powdered dry enzyme formulations were evaluated for hydrolyzing pretreated food waste residues, yielding higher reducing sugars and glucose. Additionally, the hydrolysates were used for ethanol production by Saccharomyces cerevisiae HT, resulting in a 5% ethanol yield after 72 hours of incubation. In summary, this research introduces an innovative approach to

address food waste while producing valuable enzyme formulations and ethanol, promoting sustainable and eco-friendly biofuel production.

PP8. DECIPHERING THE MULTIFACETED EFFECTS OF SALMONELLA INFECTION ON CAENORHABDITIS ELEGANS DEVELOPMENT

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ABSTRACT

Developmental defects induced by infections have been a subject of growing interest due to their potential impact on embryonic and fetal development. *Salmonella enterica* serovar Typhimurium, a gram-negative pathogen, colonizes, replicates, and persists in the gut of host nematode *Caenorhabditis elegans*. The complex interplay between host immune responses and pathogen persistence further contributes to the complexity of these defects. We are interested in investigating the impact of infection on host development using the nematode model system. We found that *S. Typhimurium* causes increased egg size, osmotically intolerant eggshell, over-folded egg morphology, matricidal hatching, and delayed and reduced hatching. The gonadogenesis was also hampered by *Salmonella* infection. When *C. elegans* is infected by wild-type Salmonella and bacterial mutants, we found that hilA, Δspi-1, and Δspi-1Δspi-2 exposed worms showed no defects and were comparable to OP50 control condition, suggesting SPI-1-associated effectors being involved in causing the observed phenotypes. We have analyzed various signaling genes involved in pathogen combat. Insights into these processes can shed light on strategies for prevention, early detection, and intervention to mitigate the adverse outcome of developmental defects induced by *Salmonella* infection.

PP9. IDENTIFICATION AND CHARACTERIZATION OF PUTATIVE DRUG TARGETS IN UROPATHOGENIC ESCHERICHIA COLI BY PROTEIN-PROTEIN INTERACTION NETWORK ANALYSIS: IN SILICO APPROACH

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ABSTRACT

Urinary tract infections (UTIs) are among the most common bacterial infections worldwide. The most common etiological agent is uropathogenic *Escherichia coli*. The occurrence of high rates of antimicrobial resistance among UPEC has complicated therapeutic management and emphasized the need for new drug targets. The use of OMICS technologies provides an attractive alternative to experimental methods in the discovery of drugs and decreases the chances of drug failure in later stages of drug development. The present study was performed to identify and characterize promising drug targets against a highly virulent UPEC strain CFT073 by utilizing a hierarchical in silico approach. We conducted the study in four phases.

In phase 1, three proteins were mined through a chokepoint, virulence, and resistance genes analysis. The proteins selected from Phase 1 were further subjected to the nonhomology analysis in Phase 2. In phase 3, co-evolution analysis was done to find non-homologous proteins interacting with virulence and resistance genes at high correlation values. We found eight putative drug targets interacting with five virulence and two resistance genes. Most identified drug targets are part of distinct metabolic pathways. In phase 4, qualitative characterization of the above drug targets was performed, including protein location in the bacterial cell, broad-spectrum analysis, interactome analysis, drugability, and essentiality analysis. PCR-based confirmation of identified drug targets in clinical isolates of UPEC was also carried out. The findings of this study may aid in discovering new antibacterial agents for better treatment of *E. coli* UTIs.

PP10. STUDY TO DELINEATE THE ALLEVIATING IMPACT OF MURRAYA KOENIGII SILVER NANOPARTICLES ON HIGH FAT DIET INDUCED HYPERCHOLESTEROLEMIA AGAINST TESTICULAR DYSFUNCTIONING

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ABSTRACT

Hypercholesterolemia is a common disease affecting 25% of adults in developed nations. It is the result of elevated low-density lipoprotein cholesterol, downregulated high-density lipoprotein cholesterol and its imbalance. This imbalance leads to the generation of free radical species and causes lipid peroxidation, which further induces morphological changes in spermatozoa, along with altering the sperm count, sperm motility. Literature survey revealed that silver nanoparticles synthesised from plant extract exhibited anti-oxidative effect and restoring testicular damages. Therefore, the present study was aimed to find the therapeutic effect of *Murraya koenigii*-mediated silver nanoparticles (MK-SNPs) on high fat diet (HFD) induced hypercholesterolemia in male reproductive system. MK-SNPs were characterized by UV, FTIR, TEM, DLS, Zeta potential, and EDX. The characterization showed spherical MK-SNPs with diameter 5-10 nm, along with zeta potential of -16.4 mV. For in-vivo study, male LACA mice were divided into four groups: Group I (C), Group II (HFD), Group III (MK-SNPs), High fat diet and Group IV (HFD+MK-SNPs). In Group II significant decrease in sperm concentration and motility and germ cell number were observed when compared to Group IV. Oxidative stress markers viz. ROS & LPO were significantly increased. Histopathological examination showed that HDF induce alterations in testicular histoarchitecture, including high vacuolization in germinal epithelium, irregularity in basement membrane, and a decline in the number of spermatogonia, spermatocytes, and round and elongated spermatids. However, in Group IV, marked refurbishment in all abovementioned parameters were observed when compared to Group II, thus evidenced the MK-SNPs mediated protection against hypercholesterolemia induced testicular damage.

PP11. ACTIVE SITE AMINO ACID RESIDUE MUTATION ENHANCES PLASMINOGEN ACTIVATION POTENTIAL OF STREPTOKINASE

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ABSTRACT

In India, coronary heart diseases (CHDs)/ heart failure (HF) are the leading cause of mortality and morbidity. Thrombolytic therapy is the most common method employed for treating heart diseases. Among various thrombolytic agents, Streptokinase is promising therapeutic protein with potent thrombolytic activity. Streptokinase is a 47-kDa protein from pathogenic strains of the Streptococcus family i.e., *Streptococcus equisimilis*. To dissolve a blood clot, streptokinase forms a 1:1 molar complex with plasminogen and convert plasminogen to plasmin. Streptokinase protein have protease activity that degrades fibrin in the blood clot. Active site Lys59 and Lys386 amino acid residues play a crucial role in the contact activation of plasminogen and enhances the plasmin degradation ability of streptokinase. Lysine is a R-group amino acid. 386Lysine residue of streptokinase participates in interaction with plasminogen and involves in degradation of plasminogen. On its basis, we performed site-directed mutagenesis at 386Lysine with R-group amino acid i.e., L to E. Then, we generated another addition mutation i.e., L386EEKK to determine the stability and activity of streptokinase. Our results indicated that site directed mutagenesis and additional mutation enhanced enzyme activity as compared to wild type streptokinase.

PP12. ESTABLISHMENT OF A MURINE MODEL OF RHINO-ORBITO-CEREBRAL MUCORMYCOSIS

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ABSTRACT

Mucormycosis is an opportunistic, serious, rapidly progressing, angioinvasive fungal disease caused by ubiquitous environmental moulds, belonging to the class Zygomycetes and order Mucorales. *Rhizopus arrhizus* is the most common causative agent of mucormycosis. On the basis of the clinical presentation and site of infection, it is classified as rhino-orbito-cerebral (ROC), pulmonary, gastrointestinal, cutaneous, and disseminated. In India, rhino-orbito-cerebral (ROC) is the most common form of mucormycosis, mainly associated with uncontrolled diabetes, as the underlying risk factor. Despite its widespread prevalence, ROC has rarely been studied in animals. Animal models are highly essential for better understanding the pathogenesis of mucormycosis, and to evaluate various therapeutic strategies. In the present study, streptozotocin-induced, immunocompromised murine model of rhino-orbito-cerebral (ROC) mucormycosis was established. For the establishment of murine model, the mice were rendered diabetic by streptozotocin, administered intraperitoneally. Different dosages of streptozotocin were tested, for the development of diabetic state. Mice were monitored regularly; the presence of glucose and ketone was tested in urine by the use of keto-

Diastix reagent strips. Once diabetes was established, the mice were infected with multiple spore densities of *R. arrhizus*, inoculated directly into the ethmoid sinus with the help of a catheter, observed regularly for up to 10 days. Successful development of infection was confirmed by presence of viable fungi in brain tissue and histopathology.

PP13. CLP1, AN OVEREXPRESSED SUBUNIT OF CF IA AND CRITICAL INSIGHTS INTO ITS MOLECULAR INTERACTION WITH SSU72 VIA COMPUTATIONAL AND BIOPHYSICAL APPROACHES

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ABSTRACT

The cleavage and polyadenylation step is indispensable for pre-mRNA processing in eukaryotes. Defective 3′- end maturation of precursor mRNA has catastrophic effects, leading to several diseases in humans like cancer, thrombophilia, thalassemia, etc. This processing is orchestrated by a complex machinery comprising more than 20 proteins in Saccharomyces cerevisiae. Endonucleolytic cleavage followed by the addition of poly(A) tail at the 3′-end of the precursor mRNA requires CPF, CF IA and CF IB proteins. Clp1, a protein of the CFIA sub-unit and Ssu72 of the CPF are both indispensable for the functioning of this machinery. Our inSilico analysis using docking approach provides key evidence of the Clp1 N-terminal (1-100 amino acids) domain's interaction with Ssu72. Further, molecular dynamic simulations consolidate this binding between Clp1 and Ssu72. A model for Clp1 (CFIA) association with Ssu72 (CPF) has been presented and both the proteins are vital for tethering the complex for mediating cleavage and polyadenylation reaction during the key events of pre-mRNA 3′-end processing. Besides, the Clp1 N-terminal (1-100 amino acids) has been cloned, expressed and characterized by biophysical techniques like circular dichroism (CD) and mass spectrometry (MS). We believe our work would be a stepping stone to understanding the key CF IA and CPF interactions; emphasize the importance along with deciphering individual roles of Clp1 (CF IA) and Ssu72 (CPF) proteins for the proper maturation of mRNA. Additionally, information about the clear architecture, function and integration of this cleavage and polyadenylation complex can pave way for new therapeutic interventions.

PP14. TEMPLATE-BASED DESIGN AND CHARACTERIZATION OF TERMINALLY MODIFIED AND D-AMINO ACID SUBSTITUTED SYNTHETIC PEPTIDES

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ABSTRACT

Small, synthetic peptides have been designed to counter the problems associated with natural peptides. Antimicrobial peptides (AMPs), which have demonstrated better antibacterial

activity against pathogenic bacterial strains than commercially available antibiotics, are a class of medicines with considerable promise for therapeutic application. However, the use of naturally derived AMPs has a number of drawbacks, especially when treating invasive diseases. These restrictions include high manufacturing costs because of their complex design, host toxicity, protease degradation, extensive serum binding and loss of antibacterial action in the presence of physiological salt concentrations. For AMPs to become potent therapeutic agents that may be employed in clinical settings, these constraints must be overcome. Synthetic peptides offer several advantages over their natural counterparts, such as potent antibacterial activity, low production costs and no or very low toxicity while maintaining their superior antibacterial action. *De novo* minimalist design of amphipathic peptides, sequence modifications from naturally occurring template peptides, and the use of bioinformatics and combinatorial libraries to assist in the identification of new lead sequences are some of the general approaches used in the design and structure-activity relationship (SAR) studies of synthetic AMPs. This current work is a pilot study that involves the design, development, and validation of synthetic peptide analogues with improved potency and bioavailability. *In vitro* activity of the designed peptides against a set of pathogenic bacterial strains confirmed their antimicrobial potential.

PP15. RENAL CANCER STEM CELLS: CHARACTERIZATION AND TARGETED BIOMARKERS

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ABSTRACT

One of the most common types of cancer worldwide (9th most commonly diagnosed) is renal cell carcinoma (RCC). Tumors are heterogeneous and are composed of differentiated cancer cells, stromal cells, and cancer stem cells (CSCs). CSCs possess two main properties: self-proliferation. As CSCs are involved in the resistance mechanisms to radio several new strategies have been proposed to directly target CSCs in RCC have tried to establish unique biomarkers to renewal and chemotherapies, so far, many studies identify CSC populations in RCC. At the same time, different approaches have been developed with the aim of isolating CSCs. Consequently, several markers were found to be specifically expressed in CSCs and cancer stem- like cells derived from RCC such as CD105, CD44, CD133, at eliminating CSCs have bee CD24, and CXCR4. A series of innovative therapies aiming n designed to treat other types of cancer and have not been experimented with on RCC yet, but they reveal themselves to be promising. In conclusion, CSCs are an important player in carcinogenesis and represent a valid target for therapy in RCC patients.

PP16. GENOME WIDE IDENTIFICATION AND IN-SILICO EXPRESSION PROFILING OF BTB GENE FAMILY IN GRAPES (VITIS VINIFERA L.)

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ABSTRACT

BTB (broad-complex, tram track and bric-a-brac) proteins have diverse functions in different growth processes, biotic and abiotic stresses. However, the biological function of these proteins is still obscure in grape species and a very few reports are available on the aspect of their role in biotic and abiotic stress-related mechanisms. In the present study, we identified 69 putative BTB genes (VvBTB) in Vitis vinifera genome and performed comprehensive analysis using bioinformatic tools. We also evaluated VvBTB proteins in terms of their chromosomal and exon-intron distribution, phylogenetic analysis, promoter analysis, domain structure and subcellular localisation. The detailed phylogenetic analysis classified VvBTB proteins into five groups and further domain analysis revealed the presence of other functional domains in addition to BTB domain. Moreover, the cis-regulatory element analysis indicated the presence of diverse biotic and abiotic stress responsive elements in the promoter regions of VvBTB genes. In-silico profiling of VvBTB genes identified 47 and 16 VvBTB genes which were differentially expressed under abiotic and biotic stresses respectively. Interestingly, 50 VvBTB genes were differentially expressed during different developmental stages of leaf, inflorescence, and berries. Further, miRNA target prediction of differentially expressed VvBTB genes identified VvBTB56 as target of vvi-miR482 and VvBTB24 as target of multiple miRNAs. The present study provides the first comprehensive analysis of BTB genes in V. vinifera genome. Our research also provided the essential information which can potentially be used for further functional investigation of BTB genes in biotic and abiotic stress related mechanisms.

PP17. BURDEN OF ACUTE VIRAL BLEPHAROCONJUNCTIVITIS IN ANDAMAN ISLANDS, INDIA

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ABSTRACT

Introduction: The Andaman Islands serve as a residence for a diverse population from various cultural backgrounds. Despite this, there is a dearth of published data on the incidence of blepharoconjunctivitis in the archipelago's inhabitants. Methods: In order to assess the burden and association of viral etiologies linked with blepharoconjunctivitis among the suspected cases in the Andaman Islands, a hospital-based study was conducted between August 2017 and January 2022. Results: A total of 150 cases of blepharoconjunctivitis were reported to the Eye care Centre in Andaman Island, which includes all age groups from infant to 70 years of age. Compared to (44.66%) females, the proportion of males were higher (55.33%). Of these total cases, 40% were positive for viral etiology. Adenovirus was the most common etiology

detected (N=54), and the remaining 5% were positive for HSV-1 (N=6). The age group 21-30 years (N=14) was highly affected, followed by 31- 40 (N=12) and 41-50 years (N=12). The most common symptoms observed were Swelling of Eyelids, Eye pain, Watering eye redness, eye irritation, Swelling of Conjunctiva, Discharge and Blurry vision, and superficial punctate keratitis. This is the first report on blepharoconjunctivitis in the Andaman Islands. Conclusion: The diagnosis of viral blepharoconjunctivitis primarily relies on clinical evaluation. However, this may lead to a misdiagnosis for allergies or other ocular infections.

PP18. DEVELOPMENT OF CHEMICALLY INDUCED BREAST TUMOR MODEL IN FEMALE SD RATS: STAGES OF TUMORIGENESIS

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ABSTRACT

Breast cancer is most common cancer posing serious health concern amongst women worldwide. Approximately, 2.3 million new breast cancer cases have been reported in 2020, accounting for 11.7% newly diagnosed cancer cases and 68,996 deaths worldwide. Breast cancer is a multistep process which begins with initiation through mutations, followed by promotion of initiated malignant cells which in turn leads to tumor progression. Breast tumor can arise in different regions such as ducts, lobules and epithelial layer. Based on the origin, it is classified into carcinomas (arising from epithelial component) and sarcomas (arising from stromal component). Whereas, based on pathology and invasiveness, it is generally classified into invasive, non-invasive and metastatic breast cancer(s). Depending upon stage and diagnosis of breast cancer, various anticancer regimens like mastectomy followed by multiple chemotherapy sessions being gold standard treatment available. Still the aforementioned are associated with multiple limitations such as poor aqueous solubility, low bioavailability and multidrug resistance. Therefore, in order to explore novel anticancer agents/strategies, a rodent breast model mimicking human breast tumor events is required at basic research platform. In the present study, 7,12-dimethylbenz(a)anthracene was used to develop experimental breast cancer model in SD rats. DMBA is an aromatic hydrocarbon considered to be one of the carcinogens capable of developing mammary tumor in rats. The early morphological alterations during development of breast cancer in DMBA challenged female SD rats were characterized for lesion formation of terminal ducts, hyper plasticity and ductal canceration. Histopathologicaly, neoplastic stages leading to benign and malignant tumors were evident.

PP19. GENOME-WIDE IDENTIFICATION AND EXPRESSION ANALYSIS OF THE MYB TRANSCRIPTION FACTOR (TF) FAMILY IN RESPONSE TO DROUGHT CONDITIONS IN BRASSICA JUNCEA

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ABSTRACT

The MYB transcription factor (TF) family is reported to be associated with biological processes such as abiotic stress response, secondary metabolism, and plant growth. However, drought-stress-responsive MYB TFs were not previously studied in *B. juncea*, a major oil-seed crop. A total of 751 MYBs were found in *B. juncea* in this study, including 297 1R-BjuMYBs, 440 R2R3-BjuMYBs, 12 3R-BjuMYBs, and 2 4R-BjuMYBs. Based on phylogenetic classification, 1R-BjuMYB and R2R3-BjuMYB were further classified into J36 and B36 subclades, respectively. A computational analysis was carried out to give an insightful picture of the gene and protein arrangements, including exon-intron structure, conserved motif analysis, MYB DNA-binding domain analysis, chromosomal positions, and sub-cellular localization. Additionally, we validated the expression analysis of BjuMYBs under drought stress via RT-qPCR, and these findings were effectively facilitated by the presence of cis-regulatory elements in the sequence of these promoters. Furthermore, the miRNA-MYBTF interaction was also predicted, and most of the miRNAs involved have previously been associated with various stress and developmental processes. This study has laid the basic groundwork of MYB TF in *B. juncea* and its response to drought stress, which on further functional validation may assist in developing drought-stress tolerant Brassica crops.

PP20. FLOWER-SHAPED PEDOT AUGMENTED AG2MOO$_4$ NPS FOR ELECTROCHEMICAL DETECTION OF HOLOTRANSCOBALAMIN (HOLOTC)

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ABSTRACT

Vitamin B12 is an essential micronutrient required for the proper functioning of the human body. However, screening for vitamin B12 insufficiency is hindered by the low sensitivity of the current Total vitamin B12 test. Holotranscobalamin (holoTC) is an early indicator of the negative vitamin B12 balance as it is the first protein to decline in the serum. Given this, we report a novel impedimetric immunosensor based on flower-like poly(3,4-ethylenedioxythiophene) (PEDOT) nanostructural film impregnated with silver molybdate nanoparticles (Ag2MoO$_4$ NPS) deposited on FTO electrode. The prepared electrodes were characterized by Field emission scanning electron microscopy (FESEM) with energy-dispersive X-ray spectroscopy (EDS), X-ray diffraction (XRD), and electrochemical studies. The activated anti-holo-TC antibody was immobilized and optimized to capture the target in a response time of 10 minutes. The electrochemical performance of the sensor was carried out

by using the electrochemical impedance spectroscopy technique (EIS). A good linear relationship between ΔRct and holoTC was obtained in the range from 0.01 pg/mL to 100 ng/mL, with a detection limit of 0.08 pg/mL. The proposed sensor was successfully applied in human serum samples for holoTC detection. The experimental results showed that the immunosensor is highly selective towards holo-TC and presented an acceptable stability of 20 days with reproducibility RSD ≤ 4 %. To the best of our knowledge, this is the first developed electrochemical immunosensor for holoTC detection. Detailed results will be presented during the conference.

PP21. IN SILICO ANALYSIS OF GENOMIC LANDSCAPE OF SARS-COV-2 AND ITS VARIANT OF CONCERNS (DELTA AND OMICRON) REVEALS CHANGES IN THE CODING POTENTIAL OF MIRNAS AND THEIR TARGET GENES

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ABSTRACT

The increase of COVID-19 related morbidities and mortalities occurred due to the emergence of new variants of SARS-CoV-2. In the last few years, viral miRNAs have been the centre of study to understand the disease pathophysiology. In this work, we aimed to predict the change in coding potential of the viral miRNAs in SARS-CoV-2's VOCs (Variant of Concerns), Delta and Omicron compared to the Reference (Wuhan origin) strain using bioinformatics tools. Ab-intio based screening of viral genomes by the Vmir and validation provided 22, 6, and 6 pre-miRNAs for Reference, Delta, and Omicron. Mature miRNAs identified by MatureBayes from the unique pre-miRNAs were used for target identification by miRDB. A total of 1786, 216, and 143 high-confidence target genes were captured for GO (Gene Ontology) and KEGG (Kyoto Encyclopedia of Genes and Genomes) analysis in which Delta miRNAs targeted genes were found to be involved in pathways such as Human cytomegalovirus infection, breast cancer, apoptosis, neurotrophin signaling, and axon guidance whereas the sphingolipid signaling pathway was found for the Omicron. Furthermore, GEO (Gene Expression Omnibus) DEGs (Differentially Expressed Genes) dataset analysis revealed FGL2, TNSF12, OGN, GDF11, and BMP11 target genes down-regulated for Reference miRNAs and YAE1 and RSU1 by Delta. Few genes were also observed to be validated among up-regulated set in which MMP14, TNFRSF21, SGMS1, and TMEM192 were related to Reference whereas ZEB2 was detected in all three strains. This study thus provides an in-silico based analysis that deciphered the unique pre-miRNAs in Delta and Omicron compared to Reference.

PP22. EXPLORING THE EFFECTIVENESS OF YOGA: NEUROPSYCHOLOGY AND BIOCHEMICAL INSIGHTS

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ABSTRACT

Background: The foundation of any society relies on its police force to uphold law and order. A difficult life in the regimented forces is greatly influenced by the workplace and the form of duties. In a similar vein, newly recruited police officers must undertake demanding professional training in order to deal with crimes in society, which requires a considerable change in lifestyle. Their physical and emotional health is impacted by this. A person's physical and mental health can both be improved by Yoga, a holistic mind-body intervention. Aim: Our aim was to assess if the Yoga had any positive effects on the neuropsychology and biochemical parameters in police trainees. Methods: Participants comprised Chandigarh Police constables who had just been recently hired and were undergoing Police training. Based on inclusion and exclusion criteria, recruitment was carried out. The participants were divided into two groups: Yoga and Control. Yoga intervention was given for 3 months and assessments were done at baseline and after 3 months. Results: When comparing the Yoga group to the Control, a significant improvement was seen in the biochemical parameters of participants. Similarly, the participants in the Yoga group reported better quality of life (QoL), and improvement in the cognitive parameters. Conclusion: Yoga training can significantly improve the physical and mental health of Police trainees.

PP23. EFFICACY OF ANTIMICROBIAL COATINGS AGAINST CATHETER ASSOCIATED URINARY TRACT INFECTION(S)

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ABSTRACT

According to Centers for Disease control and prevention, a catheter-associated urinary tract infection (CAUTI) occurs when germs (usually bacteria) enter the urinary tract through the urinary catheter and cause infection. Over 150 million individuals are at risk from CAUTI annually, resulting it in being one of the most prevalent healthcare-associated infections in the world and imposing an onerous economic burden of around $115 million - $1.82 billion per

year on healthcare system. Uropathogen adhesion and colonisation on the catheter surface is the initiation step in CAUTIs, which are then followed by biofilm formation. Once biofilms formed, eradication of biofilms become challenging task as bacteria evolve complex defence mechanism against host defence processes and the prevalence of developing resistance to conventional antibiotic treatments. Scientists have developed several approaches to design antimicrobial biomaterials to circumvent CAUTIs, but these methods too have limitations such as: anaphylaxis, instability, target tissue cytotoxicity, narrow antimicrobial spectra, short term antimicrobial activity and development of antibiotic resistance. Due to broad spectrum activity of antimicrobial peptides (AMPs) against Gram-negative, Gram-positive bacteria as well as fungi, the AMPs are emerging as potential candidate in curbing CAUTIs. Therefore, in this study, a novel AMP coating for urinary catheters will be developed, and its effectiveness against CAUTIs will be evaluated.

PP24. ANTI-CANCER POTENTIAL OF HYDROETHANOLIC MURRAYA KOENIGII LEAVES EXTRACT AGAINST 7,12-DIMETHYLBENZ[A]ANTHRACENE-INDUCED BREAST CARCINOGENESIS IN RATS

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ABSTRACT

The present study aimed to evaluate the anti-cancer effect of hydroethanolic *Murraya koenigii* leaves extract (HEMKLE) against 7,12-Dimethylbenz[a]anthracene (DMBA)-induced breast cancer in rats. For the preparation of HEMKLE, *Murraya koenigii* (MK) leaves were taken from the botanical garden of the Panjab University campus, Chandigarh, and authenticated from the Department of Botany, Panjab University (accession number 22417). The phytochemical characterization of HEMKLE was performed using liquid chromatography–mass spectrometry (LC-MS). For the in-vivo study, female SD rats were divided into four different groups. Group I (C), Group II (DMBA), Group III (HEMKLE), and Group IV (HEMKLE + DMBA). Histopathogy, oxidative and antioxidant status, TUNEL assay, mRNA and protein expression of apoptotic pathway genes were conducted in in-vivo study. In LC-MS, major phytochemical constituents including flavonoids and carbazole alkaloids were identified. Furthermore, in-vivo experimentation revealed that HEMKLE administration in Group IV(HEMKLE+DMBA) significantly inhibits the tumor incidence and volume as compared to alone DMBA treated group. The antioxidant action of HEMKLE was proven from the in-vivo analysis of antioxidant marker enzymes and histopathology. Further, increase number of TUNEL positive cells was observed in co-treated animals as compared to alone DMBA treated animals. In Group IV (HEMKLE+DMBA), upregulated expression of pro-apoptotic genes and downregulated expression of anti-apoptotic gene were observed when compared to Group II(DMBA) suggested the apoptotic effect of HEMKLE. The results of the present study provide clear evidence of the chemopreventive capabilities of HEMKLE in rats with DMBA-induced breast cancer.

PP25. IN SILICO DESIGN OF MULTI-EPITOPE PEPTIDE VACCINE AGAINST ACINETOBACTER BAUMANNII

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ABSTRACT

Acinetobacter baumannii, an opportunistic and notorious nosocomial pathogen causing serious infections of the skin, lungs, soft tissues, bloodstream, and urinary tract, is responsible for more than 722,000 cases per year, worldwide. Despite numerous therapeutic developments, still no approved vaccine is available in the market for this bacterium. Therefore, this study was aimed at developing a rational vaccine design by using bioinformatic tools. Three outer membrane proteins with immunogenic potential and properties of good vaccine candidates were used to select epitopes based on a low percentile rank, high binding scores, good immunological properties, and non-allergenicity. Multi-epitope peptide construct was obtained by joining the epitopes sequentially with appropriate linkers. ClusPro 2.0 and C-ImmSim web servers were used for docking analysis with TLR-3 and immune response respectively. The Ramachandran plot showed a valid model of the construct with 99.4% residue in most favored and allowed regions. The construct was found to be highly stable and antigenic, non-allergenic, non-toxic, soluble and showing maximum population coverage. Molecular docking exhibited strong binding of the designed vaccine with TLR-3. *In silico* immune simulations indicated an immense increment in B-cell and T-cell populations. *In silico* cloning were also performed with the pET-28a (+) plasmid vector to determine the efficiency of expression in the host (*E. coli*). This designed vaccine would expedite the experimental approach for the development of a vaccine against *A. baumannii*.

PP26. THERAPEUTIC EFFICACY OF HUMAN DEFENSIN-5 AGAINST MURINE SALMONELLOSIS

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ABSTRACT

The escalating predicament of antibiotic resistance to *Salmonella* has made the treatment of invasive salmonellosis more problematic, which necessitates the search for new antimicrobial compounds. The use of antimicrobial agents alone or in combination is receiving worldwide attention as an alternative therapy for controlling microbial infections. Antimicrobial peptides (AMPs) hold extensive potential for filling these voids in treating salmonellosis. In this study, the action mode of Human defensin-5 (HD-5), an AMP was investigated against *Salmonella* Typhimurium. Bacterial loads were assessed in various tissues and found to be decreased after the therapy in treatment groups. Furthermore, in vivo therapeutic effects were evaluated by histopathological architecture and hematological parameters. Scanning electron microscopic studies were done to evaluate cellular effect of HD-5. Also, re-establishment of antioxidant levels was observed in post therapy. *Salmonella* can induce macrophage apoptosis and thus further damage the immune system. Antibacterial effect of the peptide in *Salmonella* infected

peritoneal macrophages was studied. Treatment of infected macrophages with HD-5 exhibited significant killing of intracellular *Salmonella*. Therapeutic effect of HD-5 inhibits *Salmonella* infection, laying the foundation for the development and utilization of HD-5 as an alternative to antibiotics.

PP27. DEVELOPMENT OF ELECTROCHEMICAL BIOSENSOR FOR ALZHEIMER

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ABSTRACT

Alzheimer's Disease (AD) is the third most predominantly occurring disease. It is an untreatable neurodegenerative disease characterized by progressive deterioration of brain cells and change in behavior, personality, orientation on time and space, functional capacity which affects the daily life of patient. Currently, AD is diagnosed by detecting deformities in patient's brain using sophisticated techniques including MRI (Magnetic Resonance Imaging), PET (Positron Emission Tomography) and NIR (Near Infrared). We report a electrochemical biosensor for detection of AD by using the miRNA-137 as a efficient biomarker. In this context, the copper oxide nanoparticle/polyethyleneimine/Au/Pd nanocomposite coated fluorine tin oxide electrode used as a immobilization platform for complementary DNA (cDNA) of miRNA-137. The immobilization was done between the thiolated cDNA and AuPd through covalent binding characterization of modified electrode has been done by Field emission scanning electron microscopy (FESEM), electrochemical characterizations done by Cyclic voltammetry, Electrochemical Impendence Spectroscopy. Concentration 15µg of c-DNA and hybridization time 20 min were optimized. The linear range was 1fg to 100ng/mL and limit of detection was 0.114pg/mL for detection of miRNA-137. It provides highly selectivity from complementary DNA from non-complementary DNA for miRNAs and presented a long shelf life of 28 days. In this regard, a biosensor can be an ideal alternative owing to its high sensitivity, easy-to-use procedure, cost effectiveness, and compactness. Therefore, this novel biosensor is a potential strategy to diagnosis of Alzheimer. Detailed results will be presented during conference.

PP28. IMPROVING TOLERANCE OF SACCHAROMYCES CEREVISIAE AGAINST FURFURAL THROUGH ADAPTIVE LABORATORY EVOLUTION

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ABSTRACT

The global reduction of oil reserves has led the research into improving and finding alternative renewable energy resources. Bioethanol production from lignocellulosic biomass is one of the promising alternatives. However, it is still struggling with many obstacles including lignocellulosic inhibitors such as furfural, acetic acid etc. These inhibitors seriously restrict

the growth and fermentative capacity of the yeast strains, resulting in reduced bioethanol production. Therefore, improving tolerance capability of the strains is of great significance for industrial production of bioethanol. Multiple strategies, including genetic and metabolic engineering, can be employed for strain enhancement. However, Adaptive Laboratory Evolution (ALE) offers a distinctive approach. ALE is a technique that emulates natural selection in laboratory settings to select superior traits. However, a well-designed selection process is crucial to achieve suitable traits in the strain. This method boasts advantages such as broad adaptability, heightened practicability, and facile strain transformation. In this study, we employed ALE to enhance the furfural tolerance of *S. cerevisiae*. The evolved *S. cerevisiae* displayed a significantly reduced lag phase, 20 hrs, in contrast to the 68 hrs lag phase observed in its parental strain under conditions of 20mM furfural in liquid media containing Yeast extract Peptone and Dextrose (YPD). This enhanced tolerance was consistently evidenced by spot dilution assays on solid YPD-Agar plates with 20mM furfural. This ALE derived strain of *S. cerevisiae* may have beneficial mutations. The future prospects of this work include analysis at genomics, transcriptomics, proteomics, and metabolomics levels to resolve the molecular mechanisms of adaptive evolution.

PP29. ISOLATION AND APPLICATION OF A BACTERIAL LACCASE FOR ECO-FRIENDLY DYE DECOLOURIZATION AND DENIM BLEACHING

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ABSTRACT

Synthetic dyes are widely used in textile dyeing as well as other industrial uses. These dyes, when discharged as industrial effluents, cause severe environmental pollution. To overcome this, ligninolytic enzymes, especially laccases, have been explored for their possible use in textile wastewater treatment. In the textile industry, denim, especially denim jeans, is the most widely used garment. The most desirable denim style is the worn-out effect, which is usually accomplished by a procedure known as "stone washing," which involves washing the garment with pumice stone in the presence of an oxidising chemical such as sodium hypochlorite or potassium permanganate for denim bleaching. However, this process is environmentally unfriendly as it releases large amounts of chemicals, producing pollution problems. As a result of its environmental friendliness, the use of a laccase for dye decolourization and denim bleaching has been extensively explored. In the present study, Bacillus sp. SP-2 was isolated from the textile industry effluent sites, which produced extracellular laccase. The enzymes were found to be active in the temperature and pH ranges that were suitable for their application in the textile industry. Conditions were standardized for the hyperproduction of enzymes in submerged fermentation by using classical and statistical methods. Laccase was able to decolourize a wide range of textile dyes and bleach denim in the presence as well as absence of a mediator. Therefore, laccase is a highly suitable candidate for developing a cleaner and more economical process for denim bleaching in the textile industry.

PP30. EXPLORING THE POTENTIAL OF BACTEROIDETES FOR BIOACTIVE NATURAL PRODUCTS

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ABSTRACT

Natural products (NPs) are promising source of therapeutic agents. They have made a huge contribution towards the treatment of cancer. The dependence on plants for natural products has seen a shift of focus towards microorganisms due to the diversity of bioactive products synthesised by them. Microbes (bacteria and fungi) produce a large variety of bioactive products having diverse structures and varied functions contributing towards drug research. After the exhaustive use of traditional sources like actinobacteria, a shift has been observed to the lesser explored microbes for novel NPs. There are few reports of the bioactive compounds like elansolids (antibacterial), pinensins (antifungal and antibacterial), etc. from the genus *Chitinophaga*. In silico analysis of the genome sequence of *Chitinophaga* sp. revealed the presence of several biosynthetic gene clusters (BGCs) that can contribute novel NPs. In the present study, the potential of secondary metabolites from a soil isolate, *Chitinophaga* sp. S167 was assessed for anticancer activity. Secondary metabolite extract preparation was optimized using different elicitors and in vitro antiproliferative activity was evaluated on colon cancer cell line (HCT-116). Significant cytotoxic effect of the secondary metabolites extracted from the uninduced culture was observed with an IC50 value of 13.86 µg/ml. Thus, this study highlights the anticancer potential of secondary metabolites produced by *Chitinophaga* sp. and show promise for novel drug discovery.

PP31. INVESTIGATION OF IN-VITRO ANTI-CANCER AND APOPTOTIC POTENTIAL OF ORANGE-DERIVED NANOVESICLES AGAINST BREAST CANCER CELL LINES

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ABSTRACT

Breast cancer is a prevalent and life-threatening disease affecting women globally. Despite advances in cancer treatment, there is a pressing need for effective and low-toxicity anticancer agents. Recent research has highlighted the potential of nanosized extracellular vesicles derived from edible plants in modulating cell function and facilitating biomolecules transport between cells. Mounting evidences suggests the anticancer potential of nanovesicles derived various edible plants against different types of cancer. However, the potential of nanovesicles derived from orange in treating breast cancer remains unexplored. In this study, we aimed to investigate the therapeutic effects of orange derived nanovesicles (OrDNVs) on breast cancer cell lines (MDA-MB-231 and MDA-MB-468). To accomplish our goal, we isolated nanovesicles from orange using the differential centrifugation method and characterized their size and integrity by employing DLS and FESEM. Subsequently, we evaluated the therapeutic effects of these OrDNVs on breast cancer cells. Our results demonstrated that OrDNVs

inhibited cancer cell proliferation in a dosage and time-dependent way. Furthermore, flow cytometry analyses and DAPI staining demonstrated that the anti-proliferative effect of OrDNVs was attributed to the induction of apoptosis in cancer cells. Additionally, western blotting analysis showed that the apoptotic effect of OrDNVs on breast cancer cell was mainly mediated modulation by bcl-2, bax, caspase-9 and caspase-3. This study contributes to the development of novel and effective anticancer agents with minimal toxicity. In nutstell these findings highlight the ability of OrDNVs as a novel and effective anti-cancerous agent for breast cancer treatment.

PP32. ANTIBIOFILM POTENTIAL OF A NOVEL ANTIMICROBIAL PEPTIDE WITH CONVENTIONAL ANTIBIOTICS AGAINST MDR KLEBSIELLA PNEUMONIAE

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ABSTRACT

The emergence of multidrug resistant (MDR) *Klebsiella pneumoniae* in clinical settings necessitates the development of new therapeutic options. Here, we report a novel synthetic AI-designed antimicrobial peptide (AI-AMP) with activity against ESKAPE pathogens (MIC 3-6µM). Increase in outer membrane permeability and membrane potential in presence of peptide suggested membranolytic activity against *K. pneumoniae*. The combination of 1/4×MIC AMP and 1/4×MIC colistin (1×FIC) was synergistically effective against *K. pneumoniae*, whereas 1/4×MIC AMP showed additive effect with 1/2×MIC tobramycin (1×FIC). AMP could inhibit biofilm by 27% at 1×MIC, however, in combination with colistin, the inhibition increased to 39% at 1×FIC which further went up to 56% at 2×FIC. When combined with tobramycin, inhibition was 37 and 59% at 1× and 2×FIC, respectively. AMP was able to eradicate pre-formed biofilm by 20% at 1×MIC, however, in combination with colistin, eradication was 20% at 1× and 24% at 2×FIC. Since AMP and colistin are both membranolytic, the combination was not effective against the preformed biofilms, but combination with tobramycin, increased biofilm eradication to 43 and 50% at 1× and 2×FIC, respectively. AMP mediated membrane permeabilization presumably boosted tobramycin uptake into pre-formed biofilms. This suggested that the combination of AMP and tobramycin, an aminoglycoside, was a promising option against *K. pneumoniae* biofilm.

PP33. RNA-SEQ DATA ASSEMBLY AND ANALYSIS IDENTIFIED DIFFERENTIALLY EXPRESSED GENES IN THE LESION AND NON-LESION SKIN OF INDIVIDUALS WITH VITILIGO

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ABSTRACT

Vitiligo is a chronic autoimmune disease that causes depigmentation on the skin due to the destruction of melanocytes by autoimmune mechanisms. But vitiligo's precise cause is still a

yet to be discovered. It is a complicated condition that develops when environmental and genetic variables come together. To perform transcriptome analysis, we have selected the read dataset of lesion and non-lesion skin from sequence read archive (SRA) database. The data was pre-processed using FastQC for read-quality reports and trimmomatic to remove low-quality reads. HISAT2 was used for read mapping to the genome, and feature Counts was used for read summarization. DESeq2 was used to identify differentially expressed genes based on logFC and FDR values. Enrichr was used to perform gene enrichment, and a PPI network was established using STRING and Cytoscape software. Hub genes were extracted using the cytoHubba plugin. The study involved preprocessing, mapping, quantification, DEG identification, gene enrichment analysis, and PPi analysis. HISAT2 mapped over 94% of reads to the hg38 genome, identifying 1474 DEGs with significant enrichment in GO and KEGG terms. Cytoscape mapped a PPi network with 1389 nodes and 10796 edges. The top 10 genes identified by Cytohubba's DEGREE scoring algorithm were RPS27A, MRPL13, PSMA3, SNRPG, RPL11, RPL9, CDK1, RPL5, RPS15A, and RPL26. RNA sequencing technology identified 1474 differentially expressed genes in Vitiligo, with 681 upregulated and 794 downregulated genes. These findings have advanced our understanding of Vitiligo and could lead to potential therapeutic Interventions.

PP34. ANTICANCEROUS POTENTIAL OF FERMENTED BEVERAGE INFUSED WITH PANICLE OF PENNISETUM GLAUCUM EXTRACT AGAINST MCF-7 CELL LINE

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ABSTRACT

This study aimed to evaluate the anti-cancerous efficacy of wine infused with the panicle of *Pennisetum glaucum* plant extract, against the MCF-7 cell line. The wine was prepared using apple as a substrate and infused with ethanolic extract from the panicle of *Pennisetum glaucum*. Various biochemical assays were performed to check wine quality, and phytochemical analysis was carried out using FT-IR, GC-MS, and LC-MS spectroscopy techniques. Anti-cancerous activity of wine variants was determined using MTT (3-[4,5-dimethylthiazol-2-yl]-2,5 diphenyl tetrazolium bromide) assay. Wine infused with herbal extracts has shown significant anti-cancerous efficacy against the test cell line, which may be due to the presence of bioactive compounds present in the wine. *Pennisetum glaucum* plant extract-infused wine variants showed anti-cancerous and have the potential for use as a therapeutic/ nutraceutical agent.

PP35. THE IMPACT OF MILLET-BASED DIETS ON ANAEMIA PREVALENCE IN POPULATIONS AT HIGH RISK

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ABSTRACT

Introduction: - Anaemia is still a major worldwide health concern, especially for high-risk groups like children and expectant mothers living in areas with little resources. To address anemia in these susceptible groups, this study examines the possible effects of millet-based diets as a nutritional intervention. Millets have been consumed traditionally throughout many locations because of their nutrient-rich makeup and resistance to challenging growing circumstances, making them a versatile choice. This study investigates the efficacy of including millets in the diets of high-risk people to reduce anemia prevalence through a thorough evaluation of the current literature, clinical trials, and community-based studies. To comprehend their significance in enhancing hemoglobin levels and dietary diversity, a variety of millet cultivars, cooking techniques, and overall health. The findings of this study contribute valuable insights to public health strategies aiming to reduce anemia prevalence and enhance the nutritional well-being of vulnerable populations through sustainable dietary intervention.

PP36. COMPARATIVE EXOME ANALYSIS OF PANC-1, HPAC AND MIAPACA-2 CELL LINES TO IDENTIFY HIGHLY DELETERIOUS NON-SYNONYMOUS SINGLE NUCLEOTIDE POLYMORPHISMS (NSSNPS) ASSOCIATED WITH PANCREATIC DUCTAL ADENOCARCINOMA

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ABSTRACT

Pancreatic ductal adenocarcinoma (PDAC) is an aggressive and often fatal form of pancreatic cancer primarily due to the late-stage diagnosis and resistance to standard treatments of cancer. It accounts for over 90% of all pancreatic cancer. the PANC-1 and MIA PaCa-2 cell lines, both derived from human PDAC tumors. We used whole exome sequencing data retrieved from the SRA database (SRR1171886, SRR1171889, and SRR1171900) and processed it using the Galaxy web server. The preprocessing steps involved using FastQC and Trimmomatic to eliminate low-quality reads, ensuring the data quality. Bowtie2, SortSam, and Samtools mpileup were employed for alignment, sorting, and multi-way variant pileup, respectively. Variant calling was carried out using VarScan, with a minimum read depth filter set at 80. Genetic variations associated with PDAC by analyzing single nucleotide polymorphisms (SNPs) through SNPNexus. This analysis identified 169, 142, and 153 deleterious non-synonymous SNPs (nsSNPs) in the PANC-1, MIA PaCa-2, and HPAC cell lines, respectively. Notably, 15 common genes, including well-known PDAC-associated genes like KRAS and TP53, were identified across all three cell lines. Gene Mania was used to construct an interaction network between KRAS and TP53. The genes identified can work as biomarkers and be further used for precision medicine.

PP37. COMPARATIVE TRANSCRIPTOMIC ANALYSIS IDENTIFIES PTPRC AND IL7R AS KEY GENES IN PSORIASIS AND ATOPIC DERMATITIS

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ABSTRACT

Skin conditions, such as Psoriasis (PSO) and Atopic Dermatitis (AD), represent a significant global health burden, ranking as the fourth most common non-fatal diseases. These chronic inflammatory skin disorders have complex origins, influenced by genetics, immunology, and the environment. In this study, we analyzed paired non-lesion and lesion skin samples from patients with AD and PSO. Rigorous quality control measures were applied, including FASTQC analysis, read trimming using Trimmomatic, read alignment and quantification with HISAT2 and featureCounts, and differential gene expression analysis using DESeq2 in R. Ontology and pathway enrichment analysis was conducted with enriched terms visualized using ggplot2. Protein-protein interaction networks were constructed using STRING database and CytoScape, followed by hub gene identification through Cytohubba. Gene-disease association networks were established using NetworkAnalyst. Our results revealed 395 common differentially expressed genes between AD and PSO, with 314 genes down-regulated and 80 genes up-regulated. Notably, the MCC algorithm pinpointed the top 10 hub genes, with PTPRC, CD8A, CTLA4, CD80, and IL7R exhibiting the highest degree of significance and enrichment in both GO terms and KEGG pathways. Furthermore, we explored the associations of these genes with other diseases (which are also inflammatory and autoimmune) and found supporting evidence in the existing literature. In conclusion, our study highlights three down-regulated genes shared between AD and PSO, supported by strong evidence from prior research. These genes hold promise as potential therapeutic targets and valuable insights into the pathogenesis of these challenging skin disorders.

PP38. IN SILICO FUNCTIONAL ANNOTATION OF HYPOTHETICAL PROTEINS ASSOCIATED WITH PATHOGENICITY ISLANDS OF SALMONELLA ENTERICA

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ABSTRACT

Salmonella enterica is a rod-shaped, Gram-negative facultative pathogenic bacterium that can cause food poisoning. The bacteria have a type III secretion system (T3SS) that allows it to inject effector molecules into the host cells and cause virulence. Pathogenicity islands (PIs) are unique DNA regions in bacteria that contain genes that are responsible for their virulence. While exploring PIs in the genome of *Salmonella enterica* strain FORC_019 through IslandViewer4 computational tool it was observed that there were many hypothetical proteins (HPs) encoded by its PIs. To analyze these (147) HPs associated with different PIs, a variety

of bioinformatics tools were used to predict the domain and family (InterPro, CDD, CATH, PANTHER), physicochemical characterization (ProtParam), sub-cellular localization (PSORTb), tertiary structure (TMHMM), virulence (VirulentPred) and protein-protein interactions (STRING). In this way, 43 HPs that are related to secretion systems, pore-forming proteins, exonucleases, and phage related family were annotated. Out of these, three protein structures predicted from PHYRE2 were validated using ProCheck & Verify-3D that are T3SS-effector (arginine glycotransferase), Virulence-effector protease GtgE and g-type lysozyme inhibitor PliG. Finally, STRING database search of these 3 HPs revealed significant interaction with their nearest-neighbour proteins e.g., SifB (Salmonella translocated effector); STM1026 (Gifsy-2 prophage protein); transposase; PI-encoded protein-SPI3; CigR; STM2604 (Gifsy-1 prophage head protein gpshp, gp7); terminase-gp2; head-tail preconnector-gp4 & -gp5; and DNA packaging protein Nu1. The interactive links indicate that these HPs may assist its nearest-neighbour proteins network in pathogenicity. Further, experimental verification of these HPs will definitely fetch new insights into virulence mechanism of Salmonella.

PP39. STEM CELL BASED NOVEL CANCER THERAPIES: FILLING GAPS IN TRANSITIONING PHASE OF ONCOLOGY

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ABSTRACT

Cancer is one of the most aggressive diseases known to mankind and has become a global health burden. An array of different strategies has been employed to combat multiple types of cancers but still it remains a formidable challenge with tremendous rise in mutagenic agents in environment and lack of effective therapeutic response. Conventional treatments such as surgery, chemotherapy and radiotherapy, either alone or in combination have severely affected the lives of patients. For holistic improvement of the patients' survival, novel therapies have been devised to overcome limitations of the conventional methods, such as cancer relapse (may be in the same or other parts of the body). The present review has addressed the most recent effective treatments/therapies that has revolutionized the field of oncology viz. ECM-based, p53-based, using mesenchymal stem cells, neoantigens and hydrogels etc.

PP40. GENE EXPRESSION OF PKC-Δ IN NEUROPATHIC PAIN: A MOLECULAR, BEHAVIORAL AND COMPUTATIONAL STUDY

Megha Jaswal[1], Tanzeer Kaur[2], Aryan Chugh[3], Shivani Sharma[2]

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ABSTRACT

With the prevalence among almost 9.8% of the population all around the globe, neuropathic pain is the suffering of the world in modern times. An unpleasant consequence of diseases of the somatosensory nervous system or arising from lesions in the nervous system, neuropathic pain finds its roots in multiple sclerosis, nerve injuries, spinal injuries, and even diabetes. The significant cure for consecutive pain is far from reality due to the complexity of pathophysiology and lack of evidence to back the hypothesis indicating a single root cause behind these sensations. Natural products stand out as a less toxic and potential alternative to chemically synthesized drugs. Tetrahydropalmatine, a natural product of species '*Cordyalis yanhusuo*' displays potential interactions and inhibition of sodium channel HCN9A Nav 1.7 through molecular docking via the python-based server "PatchDock" indicating conventional hydrogen bonding, alkyl interaction, hydrophobic interactions and many more etc. Further, *in vivo* molecular studies indicate the action of tetrahydropalmatine in modulating the expression of apoptotic gene PKC-δ as a standalone drug or in combination with potential compounds available currently in the pharma vertical. However, the exact biochemical and metabolic mechanism is not completely known to back the hypothesis and so this claim, present computational and *in vivo* study provides a quick insight into the possible interaction and modulatory effects of tetrahydropalmatine and provides the basis for a larger scale molecular and clinical study.

PP41. A NETWORK SYSTEM BIOLOGY AND BIOINFORMATICS APPROACH TO IDENTIFY MOLECULAR PATHOGENESIS OF OSTEOPOROSIS WITH TYPE 2 DIABETES AND CARDIOVASCULAR DISEASE

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ABSTRACT

Osteoporosis may be caused by several medical conditions and environmental factors that induce loss of bone mass and weakens the bone. Several metabolic comorbidities like type 2 diabetes (T2D) and cardiovascular disease (CVD) have been associated with Osteoporosis (OP). However, the etiology, causing factors and molecular features are still unknown. Therefore, the present study was undertaken to identify genes expressed differentially in T2D, CVD and OP, using a network-system biology approach, to identify some of the shared molecular pathways that may unwind interaction between them. We employed gene

expression transcriptomic datasets from control and disease-affected individuals and identified differentially expressed genes (DEGs) in tissues of patients with T2D, CVD and OP when compared to unaffected control individuals. Common genes among the datasets were identified. Functional annotation of these identified DEGs revealed the involvement of cell signalling and immune system associated molecular pathways. The overlapping DEGs (i.e., seen in T2D, CVD and OP datasets) were then used to extract the most significant GO terms. Hub proteins in the pathways were identified using protein-protein interaction analysis. Significant transcription factors and potential drugs which were directly related to OP and other metabolic diseases were identified. Our computational analysis findings revealed the common molecular pathogenesis of OP and metabolic comorbidities which may direct new avenues of therapy and warrant future experimental validation of the key targets.

PP42. ROLE OF HOST DEFENCE PEPTIDES IN TUMOR-MICROENVIRONMENT

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ABSTRACT

The tumor microenvironment (TME) is a distinct environment that develops as a result of the interactions between the tumor and the host as the tumor progresses. The tumor in its immediate vicinity causes it to grow. It has been increasingly evident over the last decade that the immune cells in the TME are essential for either regulating or driving tumor growth. Moreover, the tumor microenvironment is known to be associated in acquired resistance of tumors to multiple therapies as well. Drug resistance, toxicity, and immunological escape mechanisms are the main causes of treatment failure and cancer escape despite ongoing improvements in targeted therapies for cancer treatment. After a decade of research, AMP'S have turned out to be a potential solution for this problem. A class of small (6–100 amino acid) biologically active molecules known as antimicrobial peptides, or AMPs, are essential components of the innate immune system. AMPs have strong antibiotic, antifungal, and antiviral properties. Furthermore, AMP may have cytotoxic effects on tumor cells. ACPs (anticancer peptides), or cationic AMPs having anticancer capabilities, engage electrostatically with negatively charged phospholipids on the surface of eukaryotic cells to specifically detect cancer cells. Cationic amphipathic peptides might be a good source of anticancer drugs that are selective and resistant to existing resistance mechanisms since cancer cells have higher proportions of negatively charged phosphatidylserine on their surfaces than normal cells.

PP43. EVALUATION OF DIFFERENT EDIBLE COATINGS FOR QUALITY MAINTENANCE OF FRESHCUT CARROT

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[1]*Department of Microbiology, Punjab Agricultural University, Ludhiana*

ABSTRACT

Postharvest losses are widespread because of inadequate storage conditions and improper handling of perishable food items. The growing interest among researchers in recent times has been directed towards the heightened need for natural preservatives to extend the shelf life of fresh cut fruits and vegetables. Edible coating is an innovative method to extend shelf-life of food products. Present study was performed to evaluate different edible coatings viz. chitosan, pectin, alginate, starch, carrageenan and carboxymethyl cellulose for shelf-life extension of fresh cut carrots. Initially fresh cut carrots were disinfected with 100 ppm sodium hypochlorite solution to reduce microbial load. Among the coatings evaluated, pre-disinfected fresh cut carrot coated with chitosan coating showed maximum microbial inhibition having 3.85 log cfu/g TPC, 2.47 log cfu/g Y&M and 2.69 log cfu/g coliform count in comparison to control having 4.77 log cfu/g TPC, 4.03 log cfu/g Y&M, 4.17 log cfu/g coliform count at 9th day of storage period and minimal alterations in physicochemical characteristics such as pH [6.67 to 6.70], TSS [7.88-7.98 ºB], firmness [26.4- 26.6], total sugars [6.65-6.79 (g/100g)], phenols [9.60-9.70] and titratable acidity [0.15-0.16 (%)] with no statistically significant difference. The chitosan-coated samples exhibited a slight reduction in their levels of ascorbic acid content, antioxidant capacity, and carotenoids, but this decrease was minimal. Hence, chitosan has been selected to enhance the shelf- life of fresh cut carrots.

PP44. COMPARATIVE STUDY OF FERMENTATION EFFICIENCY OF MICROBIAL ISOLATES FOR TYPE II SOURDOUGH PRODUCTION

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ABSTRACT

The emergence of symptoms of irritable bowel syndrome (IBS) resulting from the consumption of fermentable oligo-, di-, and monosaccharides and polyols (FODMAPs) is ascribed to their incomplete absorption in the small intestine. This is mainly due to either lack of sufficient hydrolase enzymes in the body or non-absorption of carbohydrates. In this context, a low-FODMAP diet can be exploited for alleviating the symptoms of IBS. The present study was carried out to compare the fermentation efficiency of isolates MA1 and YB1, alone and in combination, for the production of sourdough after 48 h using whole wheat flour as substrate. pH and total titrable acidity (TTA) were found to be 4.59, 4.06, 4.40 and 0.240, 0.289, 0.264 % for isolates MA1, YB1 and MA1-YB1 combination, respectively. Maximum reduction of total sugars (87.04 %) was exhibited by isolate YB1 alone as compared to isolate MA1 (75.64 %) and combination of MA1-YB1 (82.38 %). Therefore, the present study demonstrated maximum fermentation efficiency of isolate YB1 and it has a promising

potential to be exploited for the production of type II sourdough fermented products with enhanced FODMAP reduction, as a substitute food for IBS patients.

PP45. INVASIVE ROLE OF CANCER STEM CELLS IN HEAD AND NECK CANCER

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ABSTRACT

Introduction: Cancer stem cells (CSCs) are a unique population of cells found within tumor, able to self-renew, restore the original heterogeneity of tumor even after the treatment and tumorigenic potential. Head and neck cancer (HNC) arise at an anatomic subsite including oral cavity etc. HNC is the seventh most common cancer worldwide (600,000 cases annually). About two-thirds of the Head and neck squamous cell carcinoma (HNSCC) cases occur South and South-east Asia, 300,000 deaths each year (5–8% in Europe and America and 30% in India). HNSCC represents more than 90% of HNC cases. For HNSCC, it was shown that purified cells positive for CD44, a cell surface could reproduce the heterogeneity found in the original tumor. Side population (SP) cells are a subset of progenitor cells that can extrude the dye Hoechst 33342 and exhibit CSC-like characteristics such as tumorigenic potential, stem-like gene expression and chemoresistance. Flow cytometry/fluorescence-activated cell sorting (FACS) is the most commonly used technique to identify and isolate CSCs, cell surface antigen on HNC stem cells and tag them with fluorochrome-conjugated antibodies. Another is the functional activities of aldehyde dehydrogenase (ALDH) and ATP-binding cassette transporters (ABC transporters) have been used to identify HNC stem cells. CONCLUSION: The etiologic behind such cancer is multifactorial. CSCs responsible for reoccurrence of tumor. It becomes crucial to understand, if these cells are not treated, cancer cannot be cured.

PP46. ALOE VERA CONFERS PROTECTION AGAINST CHROMIUM INDUCED DAMAGE IN HEPATIC AND RENAL TISSUES OF MICE

Tuhin Mallick[1], Neha Arora Chugh[1], Ashwani Koul[1]

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ABSTRACT

The present study was carried out to determine the modulatory effects of *Aloe vera* gel extract on chromium induced effects in hepatic and renal tissues of mice. For the study, animals were segregated into four groups: Group I (control), Group II [potassium dichromate (PD), 10mg/kg b.w., daily for 30 days], group IV [*Aloe vera* (AV), 50mg/kg b.w., on alternate days for 45 days] and group IV (AV+PD). Chromium induced damage to hepatic and renal tissues was evident from the altered serum levels of cell damage marker and organ function markers, histopathological changes, enhanced oxidative stress marker and decrease in mRNA expression of DNA damage repair associated genes (MGMT and DNA-PK). It was observed that *Aloe vera* administration to PD exposed animals led to mitigation in histoarchitecture

damage, improved levels of cell damage and organ function markers, decrease in hepatic lipid peroxidation level and enhanced expression of DNA damage repair associated genes in renal tissue. The results of this study provide some evidence regarding the beneficial effects of *Aloe vera* in managing chromium toxicity. Detailed studies regarding its modulatory effects on other organs and mechanisms involved are required to utilize its potential in managing heavy metal toxicity.

Chemical Sciences

- Chemistry

CO-ORDINATORS

Prof. Sonal Singhal

Dr. Subash Ch Sahoo

CHASCON – 2023
National Conference on
Global Science for Global Wellbeing

SECTIONAL PROGRAMME– (OCTOBER 13, 2023)
CHEMICAL SCIENCES
Venue: Department of Chemistry, Panjab University, Chandigarh

Sectional President Professor Sonal Singhal 98721 18810	Sectional Secretary Dr. Subash Ch Sahoo 8968718364
Time	**Program**
9:00 – 9:30	Commencement of Program **Venue:** Auditorium, Ground Floor, Department of Chemistry
9:30 – 10:15	**Session Chair:** Professor K. N Singh Dr. Jaya Shukla UICC Fellow & Additional Professor Department of Nuclear Medicine & PET Post Graduate Institute of Medical Education and Research *"Paving the Way in the Era of Precision Medicine"*
Session Chair: Professor K. N Singh	
10:15 – 11:15	Oral Presentations (Research Scholars) **Venue:** Auditorium, Ground Floor, Department of Chemistry
11:15 – 11:35	Tea break
11:35 – 12:15	Dr. Nitin Kumar Scientist E National Agri-Food Biotechnology Institute (NABI) *"A Multiepitope Glycan-based Fluorescent Nanocomposite with Dual Functionality for Sensing and Ablating Pseudomonas Aeruginosa"*
Session Chair: Professor Navneet Kaur	
12:15 – 13:15	Poster Presentations (Research scholars/UG/PG) **Venue:** 1. Auditorium, Ground Floor, Department of Chemistry 2. Seminar Room, Department of Chemistry
13:15 – 14:15	Lunch
14:15 – 15.30	Oral presentations (Research Scholars) **Venue:** Seminar Room, Department of Chemistry Poster Presentations (Research Scholars) **Venue:** Ground Floor Corridor of Department of Chemistry
15:30 – 16:00	Tea break
16:00 onwards	Poster Presentations (Research Scholars) **Venue:** Ground Floor Corridor of Department of Chemistry

ABSTRACTS OF ORAL PRESENTATIONS

PARTICIPANTS

S. No.	Name of participant	Affiliating institution	Title of abstract
1.	Pushpinder Kaur	Department of Chemistry, Sri Guru Gobind Singh College, Sec-26, Chandigarh-160019	Isolation of bioactive compounds and chemical profiling of polyphenols of Crataegus oxyacantha using UPLC-ESI-QTOF-MS-MS
2.	Vivek Sharma	Baba Farid Group of Institutions, Muktsar Road, Bathinda, Punjab	Recycling of plastic - bottles to high grade pet using renewable catalyst
3.	Abhivyakti	Department of Chemistry, Panjab University, Chandigarh	Exploring the catalytic activity of ZIF derived transition metal oxides for the facilitative sequestration of persistent organic pollutants from aqueous medium
4.	Anjali Vijeata	Department of Chemistry and Centre of Advanced Studies in Chemistry, Panjab University, Chandigarh 160014, India	Azetidin-2-one functionalized Cuo-CB microfibrils: A nano drug formulation with improved and controlled drug release in antimicrobial applications
5.	Ankita Garg	Department of Chemistry & Centre of Advanced Studies in Chemistry, Chandigarh 160014, India	Dual channel detection of Fe^{3+} and Ru^{3+} metal ions by "turn-off" fluorescence mechanism of novel isoindoline-1,3-dione substituted Schiff base: A theoretical and experimental details
6.	Bunty Sharma	CIL/SAIF/UCIM, Panjab University, Chandigarh, 160014, India	Engineered biocompatible dual-charge metallocatanionic vesicles encapsulating photosensitizer

			formulations for efficient photodynamic therapy
7.	Divya Tagra	Department of Chemistry and Centre of Advanced Studies, Panjab University, Sector 14, Chandigarh, 160014	Copper ferrite nanoparticles catalyzed challenging Diels-Alder reaction of aromatic chalcones with cyclopentadiene
8.	Harpreet Kaur	Centre for Nanoscience and Nanotechnology, South Campus, Panjab University, Chandigarh	Green synthesis of iron oxide nanoparticles using Syzygium cumini for sensor application
9.	Jaswinder Kaur	Department of Chemistry and Centre of Advanced Studies in Chemistry, Panjab University, Chandigarh, 160014, India	Novel cis-3-aroyl-thiourea/urea-β-lactams: Design, synthesis, molecular docking and their biological evaluation
10.	Jyoti	CIAB, Mohali and Department of Chemistry and Centre of Advanced Studies in Chemistry, Panjab University, Chandigarh, 160014, India	Alkaline hydrolysis of spent aromatic biomass for production of phenolic aldehydes, lignin, and cellulose
11.	Manjeet Singh	Department of Chemistry, Panjab University, Chandigarh	Synthesis and characterization of photomechanical crystals based on nitropentaamminecobalt(III) cation: Photo-actuation studies and photoswitch development
12.	Pooja Negi	CIAB, Mohali and Department of Chemistry and Centre of Advanced Studies in Chemistry, Panjab University, Chandigarh, 160014, India	Development of whey-fortified curcuminoid powder with enhanced stability and aqueous solubility
13.	Tamana	Department of Chemistry, Panjab University, Chandigarh	Aldol-click generated silane: A turn-on fluorescent sensor for Al^{3+} ion and exploring its anti-Alzheimer activity via molecular docking

14.	Taranveer Kaur	Centre for Nanoscience & Nanotechnology, South Campus, Panjab University, Chandigarh	Optimizing extraction of phenolic compound from fallen leaves of Syzygium cumini: A surfactant-mediated approach for enhanced efficiency
15.	Opinder Kaur Mankoo	Department of Chemistry, Faculty of Basic and Applied Sciences, Sri Guru Granth Sahib World University, Fatehgarh Sahib 140406, Punjab, India	Structural and mechanistic insights into destabilization α-Synuclein fibrils by ellagic acid using molecular dynamics simulations
16.	Rahul Gautam	Center of Innovative and Applied Bioprocessing, Mohali	Glucose isomerisation to fructose over modified ZSM-5 zeolite
17.	Amit Sharma	Department of Chemistry, Panjab University, Chandigarh	Fabrication of peppermint essential oil nanoemulsion and exploring its herbicidal potential

OP1. ISOLATION OF BIOACTIVE COMPOUNDS AND CHEMICAL PROFILING OF POLYPHENOLS OF CRATAEGUS OXYACANTHA USING UPLC-ESI-QTOF-MS-MS

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[1] *Department of Chemistry, Sri Guru Gobind Singh College, Sec-26, Chandigarh-160019,* [2] *Natural Product Chemistry and Process Development Division, CSIR-Institute of Himalayan Bioresource Technology, Palampur, Himachal Pradesh, India.*

ABSTRACT

Polyphenols are a diverse group of naturally occurring organic compounds found in plants and are known for their potential health benefits. *Crataegus oxyacantha* is a rich source of polyphenolic compounds and many of the pharmacological properties of this plant have been attributed to flavonoid components. *C. oxyacantha* has been used since ancient times for the treatment of cardiovascular disorders like arrhythmia, myocardial infarction, and congestive heart failure, also used as an antioxidant, anti-inflammatory, gastroprotective, and antimicrobial agent. Therefore, a method has been developed and validated for chromatographic profiling of phenolic compounds using UPLC-ESI-QTOF-MS/MS. The developed UPLC-DAD method was applied for the quantification of the main bioactive constituents of leaf and fruit extract of *C. oxyacantha*. The compounds were identified based on retention time, UV spectra, and mass fragmentation patterns. Moreover, the phytochemical studies of alcoholic fruit extract of *C. oxyacantha* led to the isolation of three new compounds from its family. The ethyl acetate fraction yielded Bis-(2-ethylhexyl) phthalate and (2R,3R)-taxifolin whereas, (2R,3R)-taxifolin-3-O-β-D-xylopyranoside was isolated from n-butanol fraction. The structures of these compounds were elucidated using NMR (^{1}H, ^{13}C, DEPT, HMQC, and HMBC) and HR-ESI mass spectral data

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OP2. RECYCLING OF PLASTIC -BOTTLES TO HIGH GRADE PET USING RENEWABLE CATALYST

Vivek Sharma[1]

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ABSTRACT

In the Present study recycling of PET waste has been accomplished using hydrotalcite as catalyst and Ethylene glycol (EG) as solvent at boiling point of ethylene glycol (198^{o}C) could potentially offer a sustainable solution for PET waste management. Recovered monohydroxyethyl terephthalate (MHT) has been characterized by LC-MS,^{13}C-NMR,^{1}H NMR and TGA. Monohydroxyethyl terephthalate (MHT) can then be used as feedstock for the production of new PET reducing the need for virgin resources and minimizing environmental impact. Recycling the solvent and catalyst in a study can have significant implications for sustainability and cost-effectiveness. Studying the effects of temperature and time, as well as the role of the solvent and catalyst, is crucial for understanding the overall process and optimizing its efficiency.

OP3. EXPLORING THE CATALYTIC ACTIVITY OF ZIF DERIVED TRANSITION METAL OXIDES FOR THE FACILITATIVE SEQUESTRATION OF PERSISTENT ORGANIC POLLUTANTS FROM AQUEOUS MEDIUM

Abhivyakti[1], Sonal Singhal[1]

[1]*Department of Chemistry, Panjab University, Chandigarh*

ABSTRACT

The photocatalytic proficiency of transition metal oxides can be enhanced through several advanced techniques such as heteroatom doping, defect engineering, and heterostructure formation. In this view, a ternary metal oxide was fabricated via the thermal decomposition of a tri-metallic zeolitic imidazolate framework, to introduce defect-rich states and heterojunction at the semiconductor interface. The fabricated composite was further characterized via several techniques such as P-XRD, FTIR, FE-SEM, HRTEM, XPS, etc. The ternary heterostructure exhibited enhanced photocatalytic activity in the degradation of carcinogenic pollutants present in aqueous medium. The photocatalyst was capable of removing 80.5% chlorpyrifos (an organophosphorus pesticide) and 90% doxorubicin (an antineoplastic agent) within 120 min of visible light illumination. The degradation reaction followed pseudo-first-order kinetics. The high efficiency of the photocatalyst was attributed to low photo-induced charge carrier recombination, formation of heterojunctions, and incorporation of defect-rich states.

OP4. AZETIDIN-2-ONE FUNCTIONALIZED CUO-CB MICROFIBRILS: A NANO DRUG FORMULATION WITH IMPROVED AND CONTROLLED DRUG RELEASE IN ANTIMICROBIAL APPLICATIONS

Anjali Vijeata[1], Ganga Ram Chaudhary[1], Aman Bhalla[1], Savita Chaudhary[1]

[1] *Department of Chemistry and Centre of Advanced Studies in Chemistry, Panjab University, Chandigarh 160014, India*

ABSTRACT

The increasing use of β-lactam derived antibiotics like cephalosporins, cephamycin, monobactam, carbapenems, ampicillin, and carbacephems etc has given rise to drug-resistant bacteria due to bacterially generated β-lactamase enzymes. Trans-1-(4′-methoxyphenyl)-3-methoxy-4-phenylazetidin-2-one (or Azetidin-2-one) is one of the important β-lactam derivatives with an ample range of bacterial activities yet owned few restrictions. Herein, we developed a highly biocompatible CuO-CB complex for the on-demand release of Azetidin-2-one-containing bacterial drugs. Inspired by the fact that the microfibril-based complexes possess micropores over its surface which prompts the adsorption and slow release of drugs inside bacterial cells. The synthesis of CuO nanoparticles was carried out by reflux process followed by calcination treatment with filter scraps of cigarette butts, giving rise to CuO-CB microfibrils. Subsequently, the synthesized Azetidin-2-one moieties circumvent self-assembly inside the micropores of the CuO-CB complex, leading to the formation of Azetidin-2-one@CuO-CB microfibrils. The obtained nano-formulation evades premature drug release

and triggers the on-demand release of β-lactam molecules inside bacterial cells. The controlled drug release by Azetidin-2-one@CuO-CB microfibrils over a period of 12 h ascertains an excellent bactericide delivery mechanism to combat the deadly bacterial resistance. Indeed, this study provided a new strategy for eliminating bacterial infections and beating antimicrobial resistance via nanotherapeutics.

OP5. DUAL CHANNEL DETECTION OF Fe^{3+} AND Ru^{3+} METAL IONS BY "TURN-OFF" FLUORESCENCE MECHANISM OF NOVEL ISOINDOLINE-1,3-DIONE SUBSTITUTED SCHIFF BASE: A THEORETICAL AND EXPERIMENTAL DETAILS

Ankita Garg[1], Aman Bhalla[1], Savita Choudhary[1], Ahmad Umar[2]

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\ **ABSTRACT**

A novel isoindoline-1,3-dione substituted fluorophore, 2-[1-benzyl-2-(4-methoxy-phenylimino)-ethyl]-isoindole-1,3-dione (L), has been synthesized for the dual channel sensory recognition of Fe^{3+} and Ru^{3+} metal ions via turn-off fluorescence behaviour with the limit of detection value of 0.65 µM and 0.26 µM, for Fe^{3+} and Ru^{3+} respectively. The fluorophore (L), has been characterized by utilizing various spectroscopic techniques, including ^{1H} and ^{13}C NMR, FT-IR, elemental analyses, and high-resolution mass spectrometry (HRMS). The binding stoichiometric verified from the fluorescence came out to be 1:1 for both Fe^{3+} and Ru^{3+} metal ions. The 'naked eye' response has further been utilized to develop fast, economical and simple on-site trace detection of Fe^{3+} and Ru^{3+} metal ions via preparing simple paper strips. A computational study using the DFT approach has further been carried out to incorporate new essence in terms of getting significant information regarding the complexation mode of (L) with Fe^{3+} and Ru^{3+} metal ions. The fundamental outcomes in this work will provide a new outlook for fabricating novel dual chemo-sensor that could further be employed on-site detection of metal ions with great selectivity and sensitivity. Details of the results of these studies1 will be presented and discussed.

Reference

1. Garg, A., Bhalla, A., Chaudhary, S. and Umar, A. A turn-off sensory recognition of Fe^{3+} and Ru^{3+} metal ions with novel isoindoline-1,3-dione substituted Schiff base: A detailed theoretical and experimental overview. J. Mol Liq, p.123003. (In Press)

OP6. ENGINEERED BIOCOMPATIBLE DUAL-CHARGE METALLOCATANIONIC VESICLES ENCAPSULATING PHOTOSENSITIZER FORMULATIONS FOR EFFICIENT PHOTODYNAMIC THERAPY

Bunty Sharma[1], Ganga Ram Chaudhary[1], Gurpreet Kaur[2]

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ABSTRACT

Photodynamic therapy (PDT) is a clinically approved non-invasive therapeutic technique used for the treatment of various types of cancers and bacterial infections. PDT has three main components, a photosensitizer (PS), light source, and molecular oxygen. These components act simultaneously where PS is activated by the light at a specific wavelength to optimally excite their triplet state, which results in the generation of cytotoxic reactive oxygen species (ROS) through energy and charge transfer from PS to molecular oxygen to trigger oxidative stress-induced cell death. However, the full potential of PDT has yet to be realized by the limitations of conventional PS such as poor water solubility, photobleaching, and self-aggregation. Further, the conventional clinical application of PDT is limited by the low skin penetration of visible light. Therefore, it is imperative to address these limitations of the conventional PDT through the development of next-generation of PDT. With an objective to improve the PS delivery and photophysical properties for effective PDT, a new class of nano-colloids called metallocatanionic vesicles (MCVs) have been fabricated using cationic metallosurfactants in combination with an anionic surfactant. These biocompatible MCVs were capable of enhancement of PS singlet oxygen ($^1O_2$) generation ability irrespective of the charge present on the PS both cationic and anionic. Overall, this research further concluded that the presence of metal ion in MCVs help in the enhancement of PS $^1O_2$ generation ability and also enhances the PDT efficacy against cancer cells (MCF-7 and U-251 cells) and bacteria (*S. aureus* and *E. coli*).

OP7. COPPER FERRITE NANOPARTICLES CATALYZED CHALLENGING DIELS-ALDER REACTION OF AROMATIC CHALCONES WITH CYCLOPENTADIENE

Divya Tagra[1], Meha Bhargava[1], Jyoti Agarwal[1]

[1] *Department of Chemistry and Centre of Advanced Studies, Panjab University, Sector 14, Chandigarh, 160014*

ABSTRACT

The copper ferrite nanoparticles efficiently transformed the unreactive aromatic chalcones into activated dienophiles for a Diels-Alder reaction with cyclopentadiene/ isoprene as dienes. The best results in terms of rate of reaction and product yields were obtained in an eco-friendly solvent ethanol using 5 mol% catalytic loading. Substrate scope was also investigated for a number of chalcone derivatives, and all the reactions proceeded smoothly to provide the

corresponding DA adducts in high yields (upto 89%) and good diastereoselectivities (upto >99%) with endo-preference.

OP8. GREEN SYNTHESIS OF IRON OXIDE NANOPARTICLES USING SYZYGIUM CUMINI FOR SENSOR APPLICATION

Harpreet Kaur[1], Taranveer kaur[1], Richa Rastogi[1], Pushpinder Kaur[2]

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ABSTRACT

Iron oxide nanoparticles are well known for their biocompatibility and biomedical applications. However, conventional method of synthesis of iron nanoparticles itself poses a serious problem to the environment as the chemical reagents used for synthesis and the by products of reaction itself are threat to environment. Therefore, there is an ardent need for environmental friendly processes to tackle these shortcomings. Here, we propose an environmental friendly method to synthesize iron nanoparticles using green leaves of the Jamun. Phytochemical Analysis and antioxidant activity of extract has been done to ascertain probable reductants present in the Jamun Leaves extract. Green synthesized iron oxide nanoparticles have been characterized by UV-Vis, XRD, EDX and electron microscopy. To explore the potential application of these nanoparticles for biosensors; glucose has been used as model biomolecule. Cyclic voltammetery was carried out to do concentration calibration of glucose on screen printed electrodes modified with the nanoparticles. Kinetics of nanoparticles was also studied. Performance of the modified screen printed electrode was compared with conventional method of determining the glucose concentration. i.e. enzymatic reaction of glucose with glucose oxidase. This study establishes the role of green synthesized iron oxide nanoparticles as a good nanoenzyme as it mimics the performance of glucose oxidase.

OP9. NOVEL CIS-3-AROYL-THIOUREA/UREA-B-LACTAMS: DESIGN, SYNTHESIS, MOLECULAR DOCKING AND THEIR BIOLOGICAL EVALUATION

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ABSTRACT

The ongoing emergence of novel alternative antimicrobial agents provides hope in combatting the escalating daunting problem of severe multidrug resistance. However, the development and accessibility of these new drugs incur high costs, contributing to increased human mortality rates. Researchers are now compelled to innovate cost-effective drugs that combat resistance, exhibit potent antimicrobial properties, and minimize harm to healthy cells. Considering this in mind, new compounds by incorporating aroyl-thiourea/urea at the C-3 position of β-lactams were developed. These compounds were designed with the goal of demonstrating antimicrobial properties. Biological assessments evaluate the inhibitory

potential of the synthesized cis-3-aroyl-thiourea/urea-β-lactams against various bacterial strains, including both Gram-positive and Gram-negative bacteria, as well as fungal organisms. Furthermore, we also examined their cytotoxicity on THLE-2 and MCF-7 cell lines and assessed their antioxidant activities through DPPH free radical scavenging. Molecular docking analysis provided insights into the binding sites and interactions of these compounds, revealing a variety of attractive forces that contribute to the stabilization of the ligand-receptor complexes. In addition to their promising biological activities, these compounds also met favourable ADME parameters, indicating that they possess drug-like characteristics.

OP10. ALKALINE HYDROLYSIS OF SPENT AROMATIC BIOMASS FOR PRODUCTION OF PHENOLIC ALDEHYDES, LIGNIN, AND CELLULOSE

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ABSTRACT

In order to combat the environmental issues associated with the burning of spent aromatic biomass (SAB), a method for alkaline hydrolysis of SAB has been developed to afford phenolic acids, predominantly the p-coumaric acid, lignin, and cellulose. Lignin (~15 wt%) from alkaline hydrolysate was separated by precipitation while a mixture of phenolic acids obtained was directly reacted with a green reagent, $PhI(OAc)_2$, under one-pot condition to afford a mixture of p-hydroxybenzaldehyde (>90 wt%) and vanillin (<10 wt%). Unreacted biomass obtained in the process was successfully used as a substrate for the production of cellulose (~40 wt%). The developed method exhibits potential for application on an industrial scale.

OP11. SYNTHESIS AND CHARACTERIZATION OF PHOTOMECHANICAL CRYSTALS BASED ON NITROPENTAAMMINECOBALT(III) CATION: PHOTO-ACTUATION STUDIES AND PHOTOSWITCH DEVELOPMENT

Manjeet Singh[1], Subash Ch Sahoo[1]

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ABSTRACT

Molecular crystalline materials that can sense and respond to external stimuli such as light, heat, electricity, pressure, and humidity etc. have a wide range of potential applications as smart devices, artificial muscles, and probes. As an external stimulus light is preferred due to their advantages including green energy resources and cost-effectiveness. These photomechanical crystals directly convert light energy into mechanical work and the transfer of strong photomechanical effect from dynamic crystals to hybrid polymer-composite is an evolving field of research and holds high potential for actuation and photo-switch

development. In this work, an organic counter anion (dinitrobenzoate) stabilized nitropentaamminecobalt(III) complex (Co-dnb-1) showing fast photomechanical motions under UV light (365 nm) was synthesized. Three different crystal-polymer composite films (PCF-1–3) were fabricated using photoactive crystals with polyvinylalcohol (PVA), polyvinyldifluride(PVDF) and agarose polymers by low-cost, simple and fast procedure via a Drop casting method. The composite films show quick and excellent photo-actuation though the extent varies with the polymers used. The actuation of the composite films starts immediately (<2-3 s) and can be deflected up to 90° within a few seconds of the onset of UV light. PCF-3 shows reversible photo-actuation measured up to multiple cycles. Dynamical transfer of photomechanical energy from crystal to composite films leads to the successful assembly of a prototype photo-switch. The presented work provides a new dimension towards the development of smart functional composite materials as photo-actuators and has huge potential for the development of small-scale energy harvesting applications in combination with Piezoelectric materials.

OP12. DEVELOPMENT OF WHEY-FORTIFIED CURCUMINOID POWDER WITH ENHANCED STABILITY AND AQUEOUS SOLUBILITY

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ABSTRACT

Nutraceuticals are bioactive food components that can be incorporated into our daily food habits for the expansion of health-promoting functional foods. Curcuminoids, generally extracted from *Curcuma longa*, have been significantly used against numerous chronic diseases, including cancer, diabetes, obesity, cardiovascular, pulmonary, neurological, and autoimmune diseases. As per JECFA (The Joint FAO/WHO Expert Committee on Food Additives) and EFSA (European Food Safety Authority) reports, the ADI (adequate daily intake) value of curcumin is 0-3 mg/kg. However, the utility of curcumin is greatly hindered because of its poor water solubility (~0.432 µg/ml at 37°C), which approximately translates to ~ 0.0005% aqueous solubility. The earlier attempts for solubilizing this pigment in water have resulted in opaque or turbid emulsions, which restrict their pervasive applications and warrant searching for more general, efficient, and viable routes for solubilizing curcumin in water. In continuation to our research on the development of nutritional, nutraceuticals, and processing for bio-product value up gradations, a water-soluble formulation of curcumin has been developed with polymer PVP (K30) and surfactant sodium salt of ascorbyl palmitate, which drastically enhances the solubility and stability of curcumin. In terms of food-grade application, this formulation was readily dissolved in liquid whey, which is an industrial by-product that does not have any high-value applications. Curcumin-fortified whey protein powder could be easily recovered as a solid dry powder by spray drying for use as a nutraceutical.

OP13. ALDOL-CLICK GENERATED SILANE: A TURN-ON FLUORESCENT SENSOR FOR AL3+ ION AND EXPLORING ITS ANTI-ALZHEIMER ACTIVITY VIA MOLECULAR DOCKING

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ABSTRACT

Alzheimer's disease (AD) is one of the leading neurodegenerative disorder whose cure is yet to be developed. Elevated levels of Aluminium ion and acetylcholinesterase in brain tissue are main concern for progression of AD. Hence, both detection of Aluminium ion and inhibition of acetylcholinesterase are important research areas that have gained attention. Aldol-generated chalcones and Click-derived triazoles are among the emerging privileged scaffolds for selective and sensitive detection of metal ions and as promising pharmacological drugs. The present work focuses on design and development of 'chalcogenyl-based triazole coupled organosilane' that could selectively detect neurotoxic Aluminium ion. The binding strength and ratio between the two was discovered from B–H plot and Job's plot method respectively from fluorescent studies. Further linear calibration curve was utilized to calculate the limit of detection (LOD). The possible binding site of chemosensor for Aluminium ion has been recognized from ^{1}H NMR studies and DFT calculations. Molecular docking, a computational approach was used to scrutinize the synthesized 'chalcogenyl based triazole coupled organosilane' as whether it could inhibit the activity of acetylcholinesterase and thus be further examined as potent pharmacological drug in treatment of AD.

OP14. OPTIMIZING EXTRACTION OF PHENOLIC COMPOUND FROM FALLEN LEAVES OF SYZYGIUM CUMINI: A SURFACTANT-MEDIATED APPROACH FOR ENHANCED EFFICIENCY

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ABSTRACT

Polyphenolic compounds are widely discussed for their applications in different fields like pharmaceuticals and food industry. The efficient extraction of these polyphenolic compounds is a crucial and challenging step; therefore, different methods of extraction are employed such as reflux, maceration, microwave or ultrasound-assisted extraction, pressurized extraction, surfactant-mediated extraction ,etc. Surfactants are the molecules that have both hydrophobic (water-repellent) and hydrophilic (water-attracting) regions which makes them highly effective for the extraction of a wide range of phenolic compounds .It can enhance extraction efficiency, increase the selectivity for target compounds, and reduce the need for large quantities of organic solvents, making it a greener and more cost-effective extraction method compared to traditional solvent-based techniques .Furthermore, fallen leaves are considered to be waste, and the management of solid waste is a big problem nowadays. However, fallen leaves are reported to be a rich source of polyphenolic compounds such as tannins, phenolic

acids, etc. In the presented study, the efficient extraction of phenolic compounds from the fallen leaves of Syzygium cumini (Jamun) was carried out using various surfactants such as SDS, Brij-35, Brij-58, Triton X-100, Span 40, PEG300, and PEG1500.The extraction conditions were optimized for the effect of surfactant type, concentration, and pH, and various extracts were analyzed for total phenolic content(TPC) using the Folin - Ciocalteu assay (FCA).The antioxidant activity of different extracts was calculated by DPPH assay. Span-40 at a concentration of 8mM and neutral pH was found to be the best surfactant for maximum extraction of polyphenolic compounds.

OP15. STRUCTURAL AND MECHANISTIC INSIGHTS INTO DESTABILIZATION A-SYNUCLEIN FIBRILS BY ELLAGIC ACID USING MOLECULAR DYNAMICS SIMULATIONS

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ABSTRACT

The abnormal aggregation of α–Synuclein (α–Syn) protein into the intracellular neuronal aggregates termed Lewy bodies and Lewy neurites characterize the devastating neurodegenerative condition known as Parkinson's disease (PD). The disruption of pre-existing disease-relevant α–Syn fibrils is recognized as a viable therapeutic approach for PD. Ellagic acid (EA), a natural polyphenolic compound, is experimentally proven as a potential candidate that prevents or reverses the α–Syn fibrillization process. However, the detailed inhibitory mechanism of EA against the destabilization of α–Syn fibril remains largely unclear. Continuing with our efforts on elucidating the inhibitory mechanism of various inhibitors against Aβ and α–Syn aggregation and protofibril destabilization, molecular dynamics (MD) simulations have been performed in this work to explore the putative binding mechanism of EA on α–Syn fibril and its effect on the structural stability of the fibrils. EA interacted primarily with the non-amyloid-β component (NAC) of α–Syn fibril, disrupting its β-sheet content and thereby increasing the coil content. The E46–K80 salt bridge, critical for the stability of Greek-key-like α–Syn fibril, was disrupted in the presence of EA. The binding free energy analysis using the MM-PBSA method demonstrates the favourable binding of EA to α–Syn fibril ($\Delta G_{binding}$ = –34.62 ± 11.33 kcal/mol). Interestingly, the significant reduction in binding affinity between chain H and J of α–Syn fibril on the incorporation of EA, highlights its disruptive ability towards α–Syn fibril. This is consistent with the thioflavin T (ThT) fluorescence and atomic force microscopy (AFM) results, which highlighted the disintegration of mature fibril on treatment with EA.

OP16. GLUCOSE ISOMERISATION TO FRUCTOSE OVER MODIFIED ZSM-5 ZEOLITE

Rahul Gautam[1], Priyanka Pal[1], Shunmugavel Saravanamurugan[1]
[1] *Center of Innovative and Applied Bioprocessing, Mohali*

ABSTRACT

Carbohydrates such as sugarcane, sugar beets, maize, and glucose can be used to extract fructose, a ketonic sugar with a higher level of sweetness than other naturally existing sugars. *Fructose*, a platform compound, has a wide range of applications in the food industry and chemical industry for producing a wide range of chemicals, such as 5-hydroxymethylfurfural (HMF), levulinic acid, lactic acid, and furfural. Regarding this, zeolites are employed as heterogeneous catalysts due to their characteristic properties such as shape selectivity, high surface area, and high thermal stability. Medium-pore size (MFI) zeolites are relatively less explored due to their small pore size. This study aims to enhance the catalytic activity of commercial ZSM-5 zeolite by increasing the poze size for the facile diffusion of the bulky molecule (glucose) to the active sites within the zeolite framework. The following post-synthetic approach is used to enhance the activity of MFI zeolite (ZSM-5); i) desilication process to remove the Si species from the framework to create the mesopore for facile diffusion of reactant within the zeolite, ii) dealumination process for the removal of Al species from the framework to reduce the Bronsted acid sites responsible for the side product formation; followed by iii) Sn incorporation (Lewis acidic sites) in the framework. The presence of mesopores, Al and Sn sites plays an essential role to enhance the catalytic activity of the catalyst during the isomerisation reaction, confirmed by various analytical techniques, such as N_2 sorption analysis, DRS-UV-Vis, XPS, and NH_3 -TPD.

OP17. FABRICATION OF PEPPERMINT ESSENTIAL OIL NANOEMULSION AND EXPLORING ITS HERBICIDAL POTENTIAL

Amit Sharma[1]
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ABSTRACT

The main aim of the present study is to prepare a nanoemulsion (NE) containing Menthapiperita essential oil (EO) and evaluate its herbicidal activity against T. aestivium, P. minor R, P. minor S. Low energy method was employed to produce NE which exhibited low polydispersity index and the mean droplet size remained around 100 nm even after storage for 28 days of storage. Laboratory experiments revealed that the NE at different concentrations (0.01, 0.03, 0.05, 0.07, 0.1 wt%) significantly reduced the germination index and seedling vigour index . Furthermore, we examined the effect of ionic strength at different concentrations of NaCl ranging from 1mM- 500mM. Notably, there was no significant effect on the droplet size of the NE. However, aggregation was seen at high salt concentration of >500mM. Along with it the physiochemical properties of the prepared NE like viscosity, surface tension, pH were also investigated. The preparation of NE using low energy method offers a promising practical natural herbicide for weed control in agricultural systems.

ABSTRACTS OF POSTER PRESENTATIONS

PARTICIPANTS

S. No.	Name of participant	Affiliating institution	Title of abstract
1.	Aman Bhalla	Department of Chemistry & Centre of Advanced Studies in Chemistry, Panjab University, Chandigarh-160014, India	Stereoselective synthesis of sulfonamide substituted Schiff's bases/β-lactams and their characterization
2.	Palani Natarajan	Department of Chemistry & Centre of Advanced Studies in Chemistry, Panjab University, Chandigarh-160014, India	C-H, N-H and O-H methylation of organic compounds using dimethylsulfoxide and heterogeneous photoctalyst
3.	Prasant K Nanda	Department of Applied Science, University Institute of Engineering & Technology, Panjab University, Sector-25, Chandigarh, 160014, India	Synthesis and characterization of mono, di, and tetranuclear Co (II) complexes. Structural diversity and variable temperature magnetic moment measurement
4.	Subash Ch Sahoo	Department of Chemistry, Panjab University Chandigarh	Smart photomechanical crystals towards excellent photo-actuation and photoswitch development
5.	Varinder Kaur	Department of Chemistry, Panjab University, Chandigarh, India	Anchoring tripodal receptors to core-shell carbon dots for the identification of mefenamic acid in pharmaceutical products and urine samples
6.	Deepak Wadhwa	Chaudhary Bansi Lal University, Bhiwani	A base promoted facile and efficient synthesis of sulfenylated thiazoles; Potential nicotinic alpha4beta4 receptor agonists
7.	Raghubir Singh	Department of Chemistry, DAV College, Chandigarh, India	Zinc(II) cubane cage for the encapsulation of gold nanoparticles
8.	Shallu	Department of Chemistry, Lal Bahadur Shastri Govt. Degree	Organic waste valorization towards circular and

		College, Saraswati Nagar, Jubbal, Shimla 171206	sustainable biocomposites: Study of a critical review
9.	Vivek Pathania	DAV College, Chandigarh, India	Energetically favorable interactions between antituberculosis drug isoniazid and cyclodextrin molecules in aqueous media
10.	Ankita Garg	Department of Chemistry, D.A.V. College, Chandigarh, India	Exploring interactional behavior of the drug isoproterenol hydrochloride with native cyclodextrin using ultrasonics, spectroscopic and conductance techniques
11.	Hemjot Kaur	Computational and Theoretical Chemistry Group, Department of Chemistry & Centre for Advanced Studies in Chemistry, Panjab University, Chandigarh-160014, India.	Theoretical screening of meso-substituted cobalt porphyrin electrocatalysts for oxygen reduction/evolution reactions: Surpass state-of-the-art catalysts
12.	Himanshi Bansal	Energy Research Centre, Panjab University, Chandigarh	Fabrication of antimicrobial composite coating supplemented with bioactive components for shelf-life enhancement of fresh produce
13.	Isha	Department of Chemistry GGDSD College Sector 32C Chandigarh	Photocatalytic activity of biogenically prepared Ag-ZnO heterojunction under UV irradiation
14.	Kulwinder Kaur	Department of Chemistry, Panjab University, Chandigarh, India	3-Hydroxy-benzo-γ-pyrone decorated diorganotin(IV) crystalline solid for effectual adsorption of organic dyes
15.	Monika	Energy Research Centre, Panjab University, Chandigarh	Application of doped nanomaterials in hydrogen production via photocatalytic water splitting. A review

16.	Navya Grover	Department of Chemistry, D.A.V. College, Chandigarh-160011, India	Insights from volumetric, acoustic, conductance and spectroscopic studies to study the molecular interactions of drug levocetirizine in aqueous and aqueous glucose solutions at different temperatures
17.	Neha Garg	Department of Chemistry, Panjab University, Chandigarh	Potential application of Se nanoparticles in wastewater treatment
18.	Nikita Narang	Energy research centre, Panjab University, Chandigarh	Hydrogen production by electrolytic water splitting
19.	Priyanka	Department of Chemistry, Panjab University, Chandigarh 160014, India	Constructing energetic coordination polymers using mixed-ligand strategy
20.	Sandeep Goyal	Department of chemistry, Panjab university, Chandigarh	The synthesis of eco-friendly carbon dots derived from coconut husk for environmental remediation
21.	Shalu Thakur	Department of Chemistry and Centre of Advanced Studies in Chemistry, Panjab University, Chandigarh – 160014	Synthesis investigation towards the preparation of mono- and tris-phenylselanyl functionalized diverse organoselenides
22.	Sunny Garg	Department of Chemistry, Panjab University Research Centre, Goswami Ganesh Dutta Sanatan Dharma College, Sector 32 C, Chandigarh, 160030, INDIA	Kinetic insight into invigorated photocatalytic mitigation of rhodamine-B and tetracycline by biogenic Ag@g-C_3N_4 nanocomposites: An environmentally sustainable nanomaterial for waste water treatment
23.	Swati Nag	Department of Applied Science, University Institute of Engineering and Technology, Panjab	Reaction condition induced structural diversity in Co (II) complexes showing

		University, Sector-25, Chandigarh,160014, India	single molecule magnet behavior
24.	Yamini Thakur	Department of Chemistry, Panjab University, Chandigarh, 160014, India	Synthesis of Schiff base functionalized organosilatranes for the detection of Zr(IV) ion; their cytotoxicity evaluation and anti-inflammatory activity against COX-2 via computational approach
25.	Alisha Sharma	Indian Institute of Science Education and Research, Mohali	Reactivity of bicyclic(alkyl)(amino)carbene (BICAAC) towards hydroboration of aldehydes, ketones and alkynes using metal free approach
26.	Ayanangshu Biswas	Indian Institute of Science Education and Research, Mohali	Ligand assisted Ni-catalyzed borrowing hydrogen reactions via "hydrogen atom transfer pathway" catapulted by azo-hydrazo redox couple
27.	Gagandeep Kaur	Department of Chemistry, Faculty of Basic and Applied Sciences, Sri Guru Granth Sahib World University, Fatehgarh Sahib, Punjab, India	Biophysical and computational insights into mitigation of multifaceted amyloid−β toxicity by phenol triazoles
28.	Greesh Kumar	Institute of Nano Science and Technology (INST), Sector-81, Mohali-140306, Punjab, India	Ring flipping induced co-planarity of covalent porous polymer on graphene accelerating oxygen reduction through charge-transfer kinetics
29.	Jyoti	Department of Chemistry, Chaudhary Bansi Lal University, Bhiwani	Iodine catalyzed C-2 sulfneylation of benzofurans via dehydrogenative cross-coupling

30.	Kanika Saini	Center of Innovative and Applied Bioprocessing, Mohali	Deciphering the role of ZrO_2 phases for the catalytic reductive amination of biomass derived furfural
31.	Nisha Mittal	Punjab Engineering College, Chandigarh	Catalytic oxidation of 5-HMF to 2,5-FDCA over metal loaded biomass derived graphene oxide using hydrogen peroxide
32.	Surbhi Bansal	Indian Institute of Science Education and Research, Mohali	Transcendence of bicyclic (alkyl)(amino) carbene (BICAAC) from a spectator ligand in transition metal-based catalyst to an organocatalyst: Scrutinizing two sides of the same coin
33.	Adityaveer Singh	Lal Bahadur Shastri Govt Degree College, Saraswati Nagar, Jubbal, Shimla 171206, Himachal Pradesh	Sustainable innovative technologies to cater to the growing energy needs
34.	Mamta Thakur	Lal Bahadur Shastri Govt. Degree College, Saraswati Nagar, Jubbal, Shimla 171206, Himachal Pradesh	Trend analysis: designing for green chemistry future
35.	Yashika Bhatia	Punjab Agricultural University, Ludhiana	A naphthol-based chemosensor for the detection of Pb^{2+} ions

PP1. STEREOSELECTIVE SYNTHESIS OF SULFONAMIDE SUBSTITUTED SCHIFF'S BASES/B-LACTAMS AND THEIR CHARACTERIZATION

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[1] *Department of Chemistry & Centre of Advanced Studies in Chemistry, Panjab University, Chandigarh-160014, India*

ABSTRACT

β-Lactam antibiotics persist as a profoundly employed category of antibacterial agents within the scientific realm. The perpetual demand for novel pharmaceuticals exhibiting enhanced antibacterial properties and the escalating prevalence of resistant microorganisms provided the impetus to undertake the synthesis of extensively functionalized β-lactams. Furthermore, the utilization of the β-lactam framework in the production of various β-lactam antibiotics has been acknowledged, owing to its strain energy derived from the presence of a four-membered ring. Therefore, appended with different functionalities at various position of the ring, β-lactams served as the easily accessible and versatile substrates for the organic materials. Considering the above importance of β-lactams, we hereby propose a facile approach for the fabrication of diverse β-lactam hybrids incorporating a sulfonamide moiety as the pharmacophore entity. Sulfonamides establish significant heterocyclic lineage encompassing a wide range of synthetic compounds exhibiting countless pharmacological and chemical characteristics. Sulfonamide substituted β-lactams were synthesized by treating different substituted ethanoic acid with sulfonamide substituted Schiff's bases in the presence of $POCl_3$ and Et_3N in refluxing toluene with excellent yields. The characterization of these newly synthesized compounds has been accomplished through the utilization of diverse spectroscopic methodologies, including FT-IR, ^1H and ^{13}C NMR, elemental analysis, mass spectrometry, and X-ray crystallography. The elucidation and analysis of the findings from these investigations will be presented and discussed.

PP2. C-H, N-H AND O-H METHYLATION OF ORGANIC COMPOUNDS USING DIMETHYLSULFOXIDE AND HETEROGENEOUS PHOTOCTALYST

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ABSTRACT

In order to activate *dimethylsulfoxide* for use as a methylation agent in the C-H, N-H, and O-H functionalization of organic compounds, a novel heterogeneous photo-Fenton-like method involving the in-situ generation of hydroxyl radicals by the photocatalyst under visible light irradiation has been realized. This process requires a little quantity of the photocatalyst to produce the desired methylated heteroarenes in moderate to good yields under ambient conditions. Under light, the photocatalyst basically undertakes single electron transfer with H_2O and O_2 to produce hydroxyl radicals (•OH), which are then added to DMSO to induce it to break down into $•CH_3$ radicals. The generated $•CH_3$ radical attacks the reactant's most

electron-deficient site nucleophilically, followed by deprotonation to produce the desired product. Additionally, the heterogeneous photocatalyst is simply recoverable and may be utilized again without considerably losing its initial reactivity.

PP3. SYNTHESIS AND CHARACTERIZATION OF MONO, DI, AND TETRANUCLEAR CO (II) COMPLEXES. STRUCTURAL DIVERSITY AND VARIABLE TEMPERATURE MAGNETIC MOMENT MEASUREMENT.

Prasant K Nanda[1], Swati Nag[1], Ranjan Patra[2], Subash Ch Sahoo[3]

[1]Department of Applied Science, University Institute of Engineering & Technology, Panjab University, Sector-25, Chandigarh, 160014, India, [2]Amity Institute of Click Chemistry Research & Studies (AICCRS), Amity University, Sector-125, Noida, Uttar Pradesh, India., [3]Department of Chemistry & Centre for Advanced Studies in Chemistry Panjab University, Sector-14, Chandigarh, 160014, India.

ABSTRACT

Flexibility of ligands, choice of bridging groups and reaction conditions not only modulate the topology of the molecule but also have a significant impact on their physicochemical properties. Three Cobalt complexes of different nuclearity (mono, di, tetra-nuclear) were synthesized using a benzothiazole based Schiff base ligand (H_2L_1) by varying solvent, reaction condition and base used. Reaction of the ligand with $CoCl_2.2H_2O$ (1:2 ratio) in methanol, using pyridine as base yielded a mononuclear complex $[Co(L1)(H_2O)_2Py_2]\cdot MeOH$ (Co-1) whereas addition of NaN_3 resulted in a dinuclear complex $[Co_2(\mu2\text{-}L1)(N_3)_2(H_2O)_2Py_4]$ (Co-2) under similar reaction condition. A tetra-nuclear complex $[Co_4(L1)_4(\mu4\text{-}O)(\mu2\text{-}H_2O)_2]\cdot 2TEAH\cdot DMF\cdot 2H_2O$ (Co-3) is formed with same stochiometric ratio when tri-ethylamine is used as a base and the reaction was carried out at 70-80 ºC base in DMF/DMSO solvent mixture. The isothermal magnetization curves (M vs. H plots at 2 K and 10 K,) for the dinuclear complex show a value of 5.9 NμB at 2 K and 7 T, almost matching with the saturation value for two S = 3/2 systems. This behaviour also justifies the ferromagnetic interactions in the dimeric cluster. The isothermal magnetization plots almost superimposed indicating negligible anisotropy in the complex. For the tetra-nuclear complex at zero DC field, the AC magnetic susceptibility plots ($\chi M'$ and $\chi M''$ vs T) show prominent temperature and frequency dependent signals, which indicate the occurrence of slow relaxation of magnetization behaviour, which is a distinctive feature of single-molecule magnets (SMMs).

PP4. SMART PHOTOMECHANICAL CRYSTALS TOWARDS EXCELLENT PHOTO-ACTUATION AND PHOTOSWITCH DEVELOPMENT

Subash Ch Sahoo[1], Manjeet Singh[1]

[1]*Department of Chemistry, Panjab University Chandigarh*

ABSTRACT

Molecular crystalline materials that can sense and respond to external stimuli such as light, heat, electricity, pressure, and humidity etc. have a wide range of potential applications as smart devices, artificial muscles, and probes. As an external stimulus light is preffered due to their advantages including green energy resource and cost effectiveness. These Photomechnaical crystals directly convert light energy into mechanical work and the transfer of strong photomechanical effect from dynamic crystals to hybrid polymer-composite is an evolving field of research and holds high potential for actuation and photo-switch development.2 In this work, an organic counter anion (dinitrobenzoate) stabilized nitropentaamminecobalt(III) complex (Co-dnb-1) showing fast photomechanical motions under UV light (365 nm) was synthesized. Three different crystal-polymer composite films (PCF-1-3) were fabricated by coating the photoactive crystals on polyvinylalcohol (PVA), polyvinyldifluride(PVDF) and Agarose polymers by low cost, simple and fast procedure and low processing temperature (Drop casting method) respectively. The composite films show quick and excellent photo-actuation though the extent varies with the polymers used. The actuation of the composite films starts immediately (<2-3 s) and can be deflected up to 90 within few seconds of the onset of UV light. PCF-3 shows reversible photo-actuation measured up to multiple cycles. Dynamical transfer of photomechanical energy from crystal to composite films leads to successful assembly of a prototype photo-switch. The presented work provides a new dimension towards the development of smart functional composite materials as photo-actuators and small scale energy harvesting application.

PP5. ANCHORING TRIPODAL RECEPTORS TO CORE-SHELL CARBON DOTS FOR THE IDENTIFICATION OF MEFENAMIC ACID IN PHARMACEUTICAL PRODUCTS AND URINE SAMPLES

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ABSTRACT

A novel tripodal amine compound (TPA), featuring -OH, N, and S donors, is synthesized for the purpose of functionalizing core-shell carbon dot composite (FCDs@SiO_2-TPA). The characterization of TPA is conducted using methods such as FT-IR, TGA, BET, SEM, TEM, and EDS. Similarly, spectroscopic and spectrometric techniques are employed to characterize the resulting composite. Despite the presence of other medications like ibuprofen sodium, acetylsalicylic acid, naproxen sodium, diclofenac sodium, and ketoprofen, the composite demonstrates preferential recognition ability for mefenamic acid (MFA). This composite also enables the quantification of MFA by gauging the quenching response of emission at excitation = 350 nm and emission = 460 nm (with a linear range of 1-8 M and a limit of

detection of 197 nM). The emission signal quenching is attributed to Photoinduced Electron Transfer facilitated by hydrogen bonding between the sensing probe and MFA, as supported by Density Functional Theory calculations and ^{1}H NMR titration. The composite, FCDs@SiO_2-TPA sensing probe, proves to be a dependable and cost-effective method for the detection of MFA in pharmaceutical formulations, water samples, and cow urine samples.

PP6. A BASE PROMOTED FACILE AND EFFICIENT SYNTHESIS OF SULFENYLATED THIAZOLES; POTENTIAL NICOTINIC ALPHA4BETA4 RECEPTOR AGONISTS.

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ABSTRACT

Scheme 1. Synthesis of potential thioredoxin inhibitor thiazole compounds. It is believed that the α-7 component nicotinic acetylcholine receptors (nAChRs) assemble as homomers. The function of α-7-nAChR has been linked to learning and memory, and people with Alzheimer's disease (AD) have 7-nAChR abnormalities. Additionally, from a synthetic perspective, a multicomponent, transition metal-free strategy is receiving the greatest attention in contemporary organic chemistry. Hence, sustainable methodology is adopted for the synthesis of biologically important thiazole molecules. Base promoted C-5 sulfenylation of thiazoles are conducted using thiophenols as sulphur source and sodium hydride in acetonitrile at room temperature [scheme1]. Excellent yields are obtained with easy workup methodology. Synthesized compounds were characterized via NMR, Mass spectroscopy and IR spectroscopy. Further, synthesized compounds were evaluated as Nicotinic alpha4beta4 receptor agonist and alpha amylase inhibitor. Key words- thiazole, thiophenol, thiolation, base, Nicotinic alpha4beta4 receptor agonists alpha amylase inhibitor.

PP7. ZINC(II) CUBANE CAGE FOR THE ENCAPSULATION OF GOLD NANOPARTICLES

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ABSTRACT

The simple aperture of confined spaces generated by supramolecular hydrogen self-assembly cages help in substrate intake and product release for catalytic applications. A polyoxometalate Zn(II) cubane cage is synthesized in this study, and the tetrametallic cluster on self-assembly generates extrinsic large pockets that aided in the encapsulation of gold nanoparticles (AuNPs). FTIR, TGA, BET, SEM, TEM, XPS, H_2-TPR, and PXRD analyses were used to characterize the Zn@AuNPs. Furthermore, such cage-anchored AuNPs created Au-H species when exposed to visible light and have been further used as heterogeneous catalyst for the conversion of biomass to value-added products.

PP8. ORGANIC WASTE VALORIZATION TOWARDS CIRCULAR AND SUSTAINABLE BIOCOMPOSITES: STUDY OF A CRITICAL REVIEW

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ABSTRACT

Organic waste valorization is a significant aspect of green and sustainable chemistry, which aligns with current research interests. It involves the conversion of organic waste materials into valuable products such as biofuels, bioplastics, and biochemicals, thereby reducing pressure on non-renewable resources, waste and environmental pollution. The adoption of circular production and consumption patterns that counteract the current issues related to the depletion of natural resources, global warming, and environmental pollution is one of the most pressing global challenges that faces our society. Considering the potential of organic waste and residue streams to be transformed into valuable products, much effort is now being directed to foster circular bio-economy strategies. Organic waste valorization has attracted much attention from fundamental and applied fields, given its wide availability and versatility. This review aims to provide an insight into valorisation of organic waste of aquatic, agricultural, forestry and animal origin to polymeric matrices, bio-nanoparticles and their combination. An overview of the introductory analysis dealing with state-of-the-art circular bioeconomy, recycling and upcycling along with a critical literature review in the context of bio- polymers and derived nanoparticles is provided. Various countries and regions have implemented policies to promote organic waste valorization as part of their sustainability goals. These policies often include incentives for recycling and composting. The establishment of organic waste conversion routes will lead to innovative bio-based industries, opening new market opportunities for bio-based products and achieving efficient resource utilisation. However, it is necessary to overcome the social, economic and political barriers still being encountered.

PP9. ENERGETICALLY FAVORABLE INTERACTIONS BETWEEN ANTITUBERCULOSIS DRUG ISONIAZID AND CYCLODEXTRIN MOLECULES IN AQUEOUS MEDIA

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ABSTRACT

In biological systems, activity of drug molecule such as transportation, absorption, and binding with solvent molecules, depend on its solvation behaviour. Interaction between drug and solvent molecules can alter the structural arrangements in solution which are important in understanding the pharmacodynamics and pharmacokinetics of drugs. In present study, we use the concept of host-guest chemistry using β-cyclodextrin as a carrier molecule to control the Isoniazid (INH) activity, enhancing aspects like solubility and bioavailability and maintaining its biological effect. The effect of β-cyclodextrin on INH was studied to interpreting the

process of inclusion complex and nature of interactions present in the solution. Volumetric and compressibility investigations are crucial to understanding the molecular interactions between various components of solutions. Transfer properties reveal key information regarding strong solute-cosolute interaction in the drug/β-CD/water system. In the solution phase, 1H-NMR titration was employed to elucidate the encapsulation of INH in the hydrophobic cavity of carrier molecule. The change in δ value of aromatic protons of INH on aliquot addition of β-cyclodextrin solution, suggest the insertion of INH molecule from the wider rim of β-CD. The thermodynamics of the system was discussed in terms of change in Gibbs free energy and was found to decrease on addition of β-CD in drug/water system, which points towards the energetically favorable interactions between drug and cyclodextrin.

PP10. EXPLORING INTERACTIONAL BEHAVIOR OF THE DRUG ISOPROTERENOL HYDROCHLORIDE WITH NATIVE CYCLODEXTRIN USING ULTRASONICS, SPECTROSCOPIC AND CONDUCTANCE TECHNIQUES

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ABSTRACT

In biological systems, the behaviour of a drug molecule, including its transportation, absorption, and interaction with solvent molecules, is contingent upon its solvation characteristics. The interaction between drug and solvent molecules has the potential to modify the structural configurations within a solution. These alterations hold significance in comprehending the pharmacodynamics and pharmacokinetics of drugs. In this work, we attempted to understand the molecular interactions between β-cyclodextrin (β-CD) and the pharmaceutical compound isoproterenol hydrochloride (IPH) in an aqueous solution. The behaviour of drugs in biological processes can be studied through the physiochemical properties of drug molecules. Standard partial molar volumes and compressibility of drugs in aqueous solutions are useful to understand the solute-solvent and solute-cosolute interactions and the formation of inclusion complexes. These properties are sensitive to the degree and nature of the solvation of solute. In the solution phase, a proton NMR titration experiment to elucidate the encapsulation of IPH into a hydrophobic pocket of β-CD, a 1:1 stoichiometry confirmed by Scott's plot, and a binding energy of 22.5 M^{-1} were found for the IPH-β-CD complex. We also looked at how the conductivity of isoprenaline hydrochloride changed with temperature in different solvent systems. As the free energy of the aqueous IPH solution decreases with the addition of β-CD. These findings provided further evidence for a 1:1 complex between IPH and β-CD. The shifts in Gibbs free energy defined the system's thermodynamics.

PP11. THEORETICAL SCREENING OF MESO-SUBSTITUTED COBALT PORPHYRIN ELECTROCATALYSTS FOR OXYGEN REDUCTION/EVOLUTION REACTIONS: SURPASS STATE-OF-THE-ART CATALYSTS

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ABSTRACT

Mettaloporphyrins have emerged as a promising candidate for oxygen reduction and evolution (ORR/OER) reactions. These reactions rely on expensive precious metal-based electrocatalysts, highlighting the need to develop cost-effective alternatives that are both active and stable. In this study, we conducted a first-principle investigation using density functional theory (DFT) to evaluate the performance of ORR/OER. Porphyrin ring was manipulated by adding meso-phenyl substituents. Subsequently, the phenyl groups were replaced with bulky ortho/para-anilino groups resulting CoTPP, CoTPP-o-NMe_3, and CoTPP-p-NMe_3 catalysts. We analyzed the free energy profile of each catalyst to understand the impact of peripheral substitution on overpotential. Our findings reveal that CoTPP-o-NMe_3 displays exceptional bifunctional electrocatalytic activity for both ORR and OER (ηORR = 0.45 eV and ηOER = 0.28 eV). Specifically, its ORR performance is comparable to that of a platinum catalyst and it outperforms benchmark catalysts based on Ir and Ru for OER. Through an in-depth analysis of the free energy profile, scaling relationship, electrode potential effects, frontier molecular orbitals and energy descriptors, we provide a comprehensive explanation for the excellent bifunctional catalytic activity of CoTPP-o-NMe_3. This study underscores the importance of reducing overpotential to develop efficient and long-lasting catalysts suitable for hydrogen production and fuel cell applications.

PP12. FABRICATION OF ANTIMICROBIAL COMPOSITE COATING SUPPLEMENTED WITH BIOACTIVE COMPONENTS FOR SHELF-LIFE ENHANCEMENT OF FRESH PRODUCE

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ABSTRACT

Fruits and vegetables are essential in the human diet due to the health and nutritional benefits associated with their intake. However, due to improper storage practises and handling of the fresh food products, postharvest losses are widespread. Due to their perishable nature, fruits and vegetables have a limited shelf life due to both intrinsic and extrinsic variables. Edible coatings appear to be a cutting-edge technique that has been proven to offer a favourable and secure approach to extending the shelf life of products among the other postharvest technologies accessible. In the current investigation, different ratios of starch and chitosan

were combined with the addition of an essential oil to create edible coatings. Following this, several physical characteristics of the produced coatings, including moisture content, thickness, contact angle tensile qualities, water and oil solubility, etc., were tested. The coatings morphology was examined using FTIR, SEM, and XRD, and their thermal stability was assessed using thermogravimetric assay. The antibacterial activities of the produced coatings were also evaluated. After a coarse of 20 days in refrigeration period, coated grapes showed an improved look and experienced less weight loss than the control group. The oil-based composite coatings delayed the ripening of the grapes, which reduced weight loss, enhanced moisture retention, and preserved the titrable acidity, pH values, and sensory qualities. Hence the proposed composite coating had a great prospects in shelf life extension of perishables.

PP13. PHOTOCATALYTIC ACTIVITY OF BIOGENICALLY PREPARED AG-ZNO HETEROJUNCTION UNDER UV IRRADIATION.

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ABSTRACT

Herein, a novel single-step biogenic deposition precipitation (BDP) approach has been reported as a simple rout in order to produce an efficient Schottky contact between noble metal nanoparticles and wide-band-gap semiconductors. Ag–ZnO hetero junctions are biogenically prepared using fennel seed extract (FSE). The biomolecules present in the seeds functioned as novel biogenic materials for the precipitation of adsorbed silver ions (Ag^{+}) on ZnO particles as metallic silver (Ag^{0}). The prepared composite materials were characterized using X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FT-IR), energy dispersive X-ray (EDX) study, X-ray photoelectron spectroscopy (XPS), photoluminescence spectroscopy (PL) and high-resolution transmission electron microscopy (HR-TEM). The prepared nanocomposites shows excellent photo catalytic activity towards reduction/degradation of colored (rhodamine B (Rh-B) dye) and colorless (chlorpyrifos pesticide) pollutants as well when irradiated under solar light. Amongst all the prepared photocatalysts 3wt% Ag–ZnO hybrid composite showed the best photocatalytic activity by efficiently degrading hazardous organic pollutants within a short period of time.

PP14. 3-HYDROXY-BENZO-γ-PYRONE DECORATED DIORGANOTIN(IV) CRYSTALLINE SOLID FOR EFFECTUAL ADSORPTION OF ORGANIC DYES

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ABSTRACT

A glucosyl appended chromone-based diorganotin(IV) crystalline solid (DOC) is obtained from 3-hydroxy-benzo-γ-pyrone. The combination of organotin(IV) unit, glucosyl substituent and chromone skeleton introduced some special features to the solid including controlled solubility, water stability, and plenty of interactive sites. The formation of products is supported by FT-IR spectroscopy, multinuclear NMR spectroscopy, CHN elemental analyses, mass spectrometry, scanning electron microscopy, thermal gravimetric analysis, and single-crystal X-ray diffraction analyses. The DOC molecules led to herringbone architecture via O–H···O, C–H·····Sn, C–H···O, C–H·····π, and π···π interactions. Furthermore, the DOC has been found efficient adsorbent for organic dyes with a partition coefficient of 793.3 mg g^{-1} μM^{-1} for Brilliant blue. The Langmuir model and pseudo-second-order model well-described the adsorption parameters. Based on the results, the DOC is anticipated as a viable option for the removal of organic dyes from an aqueous solution.

PP15. APPLICATION OF DOPED NANOMATERIALS IN HYDROGEN PRODUCTION VIA PHOTOCATALYTIC WATER SPLITTING. A REVIEW

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ABSTRACT

The conversion of solar energy into hydrogen through photocatalysis is a promising method for obtaining renewable and eco-friendly energy to meet future energy demands. Hydrogen is an exceptional energy carrier due to high energy density (141.8106 J/kg), ease of storage, transportation and renewable nature. In recent years, solar energy-driven photocatalysis materials have drawn significant attention to addressing the global energy and environmental crisis. However, many of the semiconductor photocatalysts are unable to absorb the visible light of the solar spectra due to their wide band gap. The incorporation of a foreign element such as a dopant in the lattice of these photocatalysts was shown to reduce their band gap and enhance visible light absorption. In this study, metal and non-metal ion doped photocatalysts with their H2 production capacity has been reviewed. Firstly, the influence of metal/non-metal dopants on the properties of host semiconductors were deduced. Then, metal (alkali, alkaline earth, transition and inner-transition metal ions) and non-metal (nitrogen, sulphur, phosphorus, oxygen and carbon) ions doped photocatalysts with their water splitting capacity were discussed. Different carbon nitride materials and metal compounds were used as host

photocatalysts. Doping process can be performed through hydrolysis, co-precipitation, solvothermal, thermal decomposition, sol–gel and spin coating methods. In the end, the challenges, future perspectives and conclusion were outlined.

PP16. INSIGHTS FROM VOLUMETRIC, ACOUSTIC, CONDUCTANCE AND SPECTROSCOPIC STUDIES TO STUDY THE MOLECULAR INTERACTIONS OF DRUG LEVOCETIRIZINE IN AQUEOUS AND AQUEOUS GLUCOSE SOLUTIONS AT DIFFERENT TEMPERATURES.

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ABSTRACT

Levocetirizine, an antihistamine drug, has been studied using volumetric, acoustic and spectroscopic approaches to investigate the way it interacts with glucose, the most abundant carbohydrate as a function of temperature. Density and sound velocity for LC (0-0.10 ⟦mol.kg⟧^(-1)) at different temperature (298.15, 308.15 and 318.15 K) in water and in aqueous glucose (0.05, 0.10 and 0.15 ⟦mol.kg⟧^(-1)) have been recorded using Anton Paar density and sound velocity meter. The apparent molar volume (V_ϕ), limiting apparent molar volume (V_ϕ^0), apparent molar compressibility ⟦(K⟧_(ϕ,S)), limiting apparent molar compressibility (K_(ϕ,S)^0) were calculated using the experimental values. The transfer parameters of LC from water to aqueous glucose solutions were calculated additionally and these characteristics were explained using co-sphere model. The transfer volumes have also been used for estimating the interaction coefficients. Limiting apparent molar expansibility (ϕ_E^0) and Hepler's constant (⟦∂ϕ_E^0/∂T)⟧_Pwere obtained to throw light upon the structure-making/breaking effect of solute. Various acoustical parameters like isentropic compressibility (K_S), intermolecular free length (L_f), relaxation strength (r), specific acoustic impedance (Z), relative association (R_A), Wada's constant (W), Rao's constant (R_m), Van der Waals constant (b), molar volume (V_(m)) and free volume (V_f) were determined to validate the thermodynamic results.

PP17. POTENTIAL APPLICATION OF SE NANOPARTICLES IN WASTEWATER TREATMENT

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ABSTRACT

Selenium is an essential trace element in the human body present in various enzymes with antioxidant activities and several functional proteins. The application of Se nanoparticles in wastewater treatment is an emerging field of research interest these days. In this study, we report the facile synthesis and characterization of Se Nanoparticles via precipitation method using selenous acid as the precursor and NaBH4 as the reducing agent. Further, the

nanoparticles have been characterized by different techniques such as UV, FTIR, XRD, EDX and HRTEM. HR-TEM images were used to determine the morphology and size of the synthesized Se nanoparticles and it was found to be of spherical shape and of 34.8 nm in size. The synthesized nanoparticles have been utilized for the degradation of Victoria blue dye which is a major constituent of water pollution. The percentage of degradation was found to be more than 85% in 80 minutes under UV light illumination. The possible mechanism behind the degradation was mainly found to be due to the electrostatic interactions between the positively charged Se nanoparticles and the negatively charged group of the anionic dye (VB). Notably, our current protocol could to be used as an effective catalyst for the eradication of toxic pollutants.

PP18. HYDROGEN PRODUCTION BY ELECTROLYTIC WATER SPLITTING

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ABSTRACT

Hydrogen, as a clean energy carrier, plays an irreplaceable role in the future development of the energy industry. To satisfy the increasing energy demand, the technology of hydrogen production has undergone significant developments. Hydrogen production by water electrolysis has an advantage of environmental friendliness, high purity of hydrogen and simple preparation process. It is a completely clean way of producing hydrogen. Electrolytic water reaction is mainly composed of two half-reactions: hydrogen evolution reaction (HER) at cathode and oxygen evolution reaction (OER) at anode. The slow reaction kinetics result in low energy conversion. Thus, catalyst is added to improve the energy conversion efficiency. Generally, noble metal catalysts (such as Pt, Ru, Ir, etc.) are needed to improve the HER/OER reaction kinetics of electrolyzed water. Precious metals, their alloys, and oxides are still the main catalysts with the best performance, but the cost of precious metal catalysts is high, thus their application in large-scale hydrogen production by electrolysis of water is limited. This study is focused on developing transition metal-based HER/OER electrocatalysts with high catalytic activity, high electrochemical stability, and low cost. Transition metal catalysts based on Ni, Co, and Mo are highly considered because of their changeable composition and structure, abundant resources, low preparation cost, and many optimized electrocatalytic properties. Catalysts can be optimized by alloying, element doping. For, practical applications, the catalytic activity, chemical and mechanical stability of the catalytic material need to be considered to ensure that the catalytic electrode material has high efficiency and service life.

PP19. CONSTRUCTING ENERGETIC COORDINATION POLYMERS USING MIXED-LIGAND STRATEGY

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ABSTRACT

Energetic metal complexes have attracted significant attention in recent years owing to their potential as superior alternatives and are promising candidate in the advancement of energetic materials as compared to traditional energetic materials. In this study, we have investigated the crystal structure, thermal stability, and energetic properties of two one-dimensional coordination polymers (CPs). These CPs were designed and synthesized using environmentally friendly methods, employing nitrogen-rich ligands 4,4'-azobis-1,2,4-triazole (atrz) and 3,5-dinitrobenzoic acid (HDNBA) namely, $[Zn(atrz)(DNBA)_2(H_2O)_2]n$ (1) and $[Cd(atrz)(DNBA)_2(H_2O)_2]n$ (2). These CPs were characterized using various spectroscopic and analytical techniques as well as single crystal X-ray diffraction (SCXRD). Furthermore, their thermal stability, kinetic studies, energetic performance, and sensitivity were examined using TGA/DSC, bomb calorimetry, and the BAM method. The SCXRD analysis revealed that the metal ions (Zn/Cd) exhibited a distorted octahedral geometry, leading to the formation of a one-dimensional coordination polymer while simultaneously constructing a two-dimensional structural framework through intermolecular hydrogen bonding. Both CPs demonstrated similar thermal stability, but their respective heat of formation values differed significantly (1 = -894.43, 2 = 1635.93 kJ mol^{-1}). The average activation energy for 1 and 2 are found to be 143.8 and 168.0 kJ mol^{-1}, respectively. Comparative analysis of their energetic performance indicated that CP 2 outperformed CP 1 due to its higher heat of formation and density. The CP 2 exhibited higher detonation velocity (7.24 km s^{-1}) and pressure (23.67 GPa) compared to CP 1 (detonation velocity: 6.28 km s^{-1}, detonation pressure: 17.57 GPa).

PP20. THE SYNTHESIS OF ECO-FRIENDLY CARBON DOTS DERIVED FROM COCONUT HUSK FOR ENVIRONMENTAL REMEDIATION

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ABSTRACT

Carbon dots are considered as one of the advantageous materials for adsorption and wastewater treatment because of their biocompatible nature. Herein, biogenic carbon dots (CQDs) were prepared from waste coconut husk as a precursor source. CQDs displayed spherical morphology with a size range of approximately 2nm and possessed a higher specific surface area. The inherent hydrophilic nature of CQDs further supported the higher adsorption of organic toxins with maximum removal abilities of more than 90% for Victoria blue B (VB). Different dye adsorption parameters including adsorbate and adsorbent dosage, pH of reaction media and equilibrium time have been investigated. The adsorption was maximum at neutral medium. The adsorption kinetic (2nd order) and isotherms (Freund-lich-type) were well

followed on prepared CQDs. The reusability was investigated to certify the constancy of nanoparticles for the adsorptive removal of VB. The used CQDs were effectively recycled without much decrement in the adsorption capacity. The methodology presents a greener way for overcoming ecological issues with sustainable materials in an economical manner.

PP21. SYNTHESIS INVESTIGATION TOWARDS THE PREPARATION OF MONO- AND TRIS-PHENYLSELANYL FUNCTIONALIZED DIVERSE ORGANOSELENIDES

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ABSTRACT

Over the last few years, an immense endeavor has been directed toward the concoction of steady organoselenides that could be used as antioxidants, antihypertensive agents, antitumors, antimicrobials, antihypertensive agents, antiviral agents. These compounds attained a lot of significance in the scientific field as synthetic reagents and as anti-oxidants. So, a convenient and metal-free protocol for the selenylation of inert C(sp^2)─H bonds of imidazole was developed using iodine as additive under aerobic conditions. The efficiency of this methodology for the direct selenylation of different electron-rich heteroarenes like imidazole, isatin, indole, and benzimidazole has been demonstrated. This process was scalable and delivered organoselenides compounds in good yields. This protocol showed advantages of a simple operation, wide functional group tolerance, good yields, and providing an efficient route to construct C─Se bond 2,4,5-tris phenylselanyl-1H-imidazole and 2-phenylselanyl-1H-indole have been confirmed by the single crystal X-ray crystallographic analysis. Further, unsymmetrical esters and acids were synthesized via N-H functionalization of 2-phenylselanyl-1H-benzimidazole and 2,4,5-tris phenylselanyl-1H-imidazole. The novel organoselenides were characterized by 1H, 13C NMR and 77Se spectroscopy techniques.

PP22. KINETIC INSIGHT INTO INVIGORATED PHOTOCATALYTIC MITIGATION OF RHODAMINE-B AND TETRACYCLINE BY BIOGENIC AG@G-C_3N_4 NANOCOMPOSITES: AN ENVIRONMENTALLY SUSTAINABLE NANOMATERIAL FOR WASTE WATER TREATMENT

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ABSTRACT

We herein report a straightforward method for synthesizing binary Ag@g- C_3N_4 nanocomposites through phytogenic means. By utilizing the extract of foeniculum vulgare

(fennel) seeds, we were able to reduce and cap noble metal silver nanoparticles (AgNPs) (ranging from 1wt% to 5 wt%) onto graphitic carbon nitride (g-C_3N_4) without the need of chemical reducing agents or stabilizing surfactants. The polyphenolics found in seeds served as both reducing and capping agents, facilitating the reduction of Ag^+ ions into Ag^0 (AgNPs) and stabilizing the so formed nanoparticles (NPs) onto g- C_3N_4, consequently establishing a strong Schottky junction. Integration of AgNPs with g- C_3N_4 was successfully confirmed using X-ray photoelectron spectroscopy (XPS). Following electron microscopy, crystallographic, and various spectroscopic characterizations, the synthesized nanomaterials outlayed extended photocatalytic efficacy for sunlight-assisted photocatalytic mitigation reactions. The kinetic studies for photocatalytic mitigation of model dye pollutant rhodamine-B (Rh-B) together with tetracycline (TCy) pharmaceutical was investigated and rate contents were determined. Amongst the synthesized NCs, 3wt% Ag@g- C_3N_4 nanocomposite exhibited superior photocatalytic mitigation of Rhodamine-B (Rh-B) dye (99.26%) and Tetracycline (TCy) antibiotic (96.86%). Moreover, the apparent rate constants revealed a remarkable 7.72-fold ($k = 90.4 \times 10^{-3}$ min^{-1}) in photocatalytic efficacy contrary to pristine g- C_3N_4 ($k = 11.8 \times 10^{-3}$ min^{-1}). The trapping investigations revealed that superoxide radical-mediated mechanism was dominated one for the degradation. In addition, a photocatalytic degradation pathway of organic pollutants was also suggested.

PP23. REACTION CONDITION INDUCED STRUCTURAL DIVERSITY IN CO (II) COMPLEXES SHOWING SINGLE MOLECULE MAGNET BEHAVIOR

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ABSTRACT

Cobalt complexes continue to attract extensive attention owing to their wide-range of potential application in the field of catalysis, electrochemistry and magnetism. Flexibility of ligands, choice of bridging groups and reaction conditions not only modulate the topology of the molecule but also have a significant impact on their physicochemical properties. Three Cobalt complexes of different nuclearity (mono, di, tetra-nuclear) were synthesized using a benzothiazole based Schiff base ligand (H_2L_1) by varying solvent, reaction condition and base used. Reaction of the ligand with $CoCl_2.2H_2O$ (1:2 ratio) in methanol, using pyridine as base yielded a mononuclear complex $[Co(L1)(H_2O)_2Py_2]\cdot MeOH$ (1) whereas addition of NaN3 resulted in a dinuclear complex $[Co_2(\mu_2\text{-}L1)(N_3)2(H_2O)_2Py_4]$ (2) under similar reaction condition. A tetra-nuclear complex $[Co_4(L1)_4(\mu4\text{-}O)(\mu_2\text{-}H_2O)_2]\cdot 2TEAH\cdot DMF\cdot 2H_2O$ (3) is formed with same stochiometric ratio when tri-ethylamine is used as a base and the reaction was carried out at 70-80 ºC base in DMF/DMSO solvent mixture. All these complexes were characterized by various spectroscopic and analytical techniques as well as SCXRD. Variable temperature magnetic moment measurement reveals intrametallic ferromagnetic exchange

interactions between metal centers (J = 4.25 cm^{-1}) were observed for the dinuclear complex. For the tetra-nuclear complex at zero DC field, the AC magnetic susceptibility plots (χM′ and χM″ vs T) show prominent temperature and frequency dependent signals, which indicate the occurrence of slow relaxation of magnetization behaviour, which is a distinctive feature of single-molecule magnets (SMMs). This work shows how variation of reaction condition can lead to structural diversity and impact magnetic behaviour of the complexes.

PP24. SYNTHESIS OF SCHIFF BASE FUNCTIONALIZED ORGANOSILATRANES FOR THE DETECTION OF Zr(IV) ION; THEIR CYTOTOXICITY EVALUATION AND ANTI-INFLAMMATORY ACTIVITY AGAINST COX-2 VIA COMPUTATIONAL APPROACH

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ABSTRACT

Zirconium, a transition metal with medical importance, is widely used and has a generally safe profile. However, prolonged and continuous exposure can lead to detrimental consequences, this necessitates the development of quick and efficient sensors for the detection of Zr(IV) ion. The current investigation focuses on the synthesis and characterization of 4-(methylthio)benzaldehyde derived Schiff base functionalized organosilatranes (2a-2b). The probe 2a has been utilized as a UV-visible absorption based, selective and highly sensitive sensor for the detection of Zr(IV) ion with a limit of detection and association constant values of 10.89 x 10^{-7} M and 3.1 x 10^{4} M 1 respectively. The practical applicability of the synthesized sensor has been determined in water samples, yielding good percentage recovery rates. The cytotoxicity assay has been performed using SAF-1 cell line, rendering the synthesized compounds non-toxic. Furthermore, molecular docking has been performed against cyclooxygenase-2 in order to determine anti-inflammatory activity of synthesized ligand with a binding energy score of -7.51 $kcalmol^{-1}$.

PP25. REACTIVITY OF BICYCLIC(ALKYL)(AMINO)CARBENE (BICAAC) TOWARDS HYDROBORATION OF ALDEHYDES, KETONES AND ALKYNES USING METAL FREE APPROACH

Alisha Sharma[1], Sanjay Singh[1]

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ABSTRACT

Bicyclic(alkyl)(amino)carbene (BICAAC) works as a powerful catalyst for hydroboration reactions of aldehydes, ketones and alkynes. Notably, aldehydes and ketones hydroborated at faster rate and requires low catalyst loading in comparison to alkynes. During the mechanistic investigations, both experimental and theoretical evidences shows that BICAAC acting as pre-catalyst and the catalyst formed by B-H addition to the carbene centre acting as main catalyst.

PP26. LIGAND ASSISTED NI-CATALYZED BORROWING HYDROGEN REACTIONS VIA "HYDROGEN ATOM TRANSFER PATHWAY" CATAPULTED BY AZO-HYDRAZO REDOX COUPLE

Ayanangshu Biswas[1], Amreen K. Bains[1], Abhishek Kundu[1], Debashis Adhikari[1]

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ABSTRACT

Borrowing hydrogenation is an efficient method to expand the synthetic utility of abundantly available alcohols for the successful formation of C-C/ C-N bonds. In this work, a Ni(azophenolate)2-catalyst has been utilized which operates by first oxidizing an alcohol, generating a reactive carbonyl compound. This intermediate can undergo a diverse range of subsequent transformations before the catalyst redelivers the "borrowed" hydrogen to liberate the product and finally regenerates the active catalyst. In this way, alcohols are used as alkylating agents, usually generating water as the sole by-product. We have explored various synthetic transformations adopting this borrowing hydrogen method.

PP27. BIOPHYSICAL AND COMPUTATIONAL INSIGHTS INTO MITIGATION OF MULTIFACETED AMYLOID−B TOXICITY BY PHENOL TRIAZOLES

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ABSTRACT

Amyloid−β (Aβ) aggregation is crucial to Alzheimer's disease development (AD). Additionally, when coupled to Aβ, the various bio metals (Cu^{2+}, Fe^{2+}, and Zn^{2+}) catalytically cycle between different oxidative states, which causes oxidative stress and neuron damage. In search of a potent inhibitor of amyloid aggregation and suppressant of oxidative stress, we devised, produced and tested a library of sixteen compounds, 4(a−p). Among these, 4k with the o−I at the phenyl ring demonstrated the highest inhibition against Aβ42 aggregation (90.48%), equivalent to curcumin (91.86%). Additionally, 4k disintegrated Aβ42 fibrils (92.56%) more effectively than curcumin (86.39%). The formation of ROS in the copper−redox active cycle was successfully reduced by 4k. 4k interacts with the Aβ42 monomer at central hydrophobic core (CHC) region and the even edge (chain D) of the Aβ42 protofibril structure, as stated by in silico studies. Consequently, a class of designed scaffold was developed to provide a multifunctional platform for Alzheimer's disease.

PP28. RING FLIPPING INDUCED CO-PLANARITY OF COVALENT POROUS POLYMER ON GRAPHENE ACCELERATING OXYGEN REDUCTION THROUGH CHARGE-TRANSFER KINETICS

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ABSTRACT

Natural oxygen reduction reaction (ORR) occurred utilizing Fe-Porphyrin (heme iron) as an active reaction center in metalloenzymes. Iron porphyrin (FeP) as building blocks for any polymeric/framework materials is thus been studied extensively for ORR electrocatalyst. However, the low conductivity of Fe-Por has driven researchers to adopt various techniques like pyrolysis and surface modifications to enhance the charge-transfer kinetics of the catalysts in order to compete with the benchmark Pt catalyst. Herein, we have developed a metallo [Fe (II)]-porphyrin-pyrene based pi-conjugated porous polymer (FePP), which was further modified with electrophoretically exfoliated graphene (FePP@G30/3/7) to introduce the flexibility of >C-C< bond rotation resulting in-plane flipping of the bridging -Ph ring from out of plane orientation. The ring flipping-induced co-planarity was further investigated from the computational studies, where an energy-optimized all-planar structure was attained for the FePP@G30/3/7 catalyst. A delocalized charge distribution from equatorial as well as axial planes to the iron center promotes the ORR kinetics.

PP29. IODINE CATALYZED C-2 SULFNEYLATION OF BENZOFURANS VIA DEHYDROGENATIVE CROSS-COUPLING

Jyoti[1], Deepak Wadhwa[1], Suman Devi[1], Manisha Verma[1], Ajay[1]

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ABSTRACT

An environmentally benign methodology for C-2 sulfenylation of benzofurans via dehydrogenative cross-coupling is developed. Sulfenyltion at the second position is carried out using commercially available thiols in the presence of molecular iodine and DMSO. Reaction supports a wide spectrum of electronically diverse substituents on thiophenol ring. This process provides a number of benefits, including greener reaction conditions, moderate to good percentage yields, easy workup, no need for additional metal catalysts, and gram-scale synthesis.

PP30. DECIPHERING THE ROLE OF ZrO_2 PHASES FOR THE CATALYTIC REDUCTIVE AMINATION OF BIOMASS DERIVED FURFURAL

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ABSTRACT

Reductive amination of bio-based carbonyl compounds plays a crucial role in the synthesis of primary amines having wide range applications. Particularly, furfurylamine that can be derived via the catalytic reductive amination of biomass derived furfural have enormous promising applications in pharmaceutical, agrochemical industry and polymer industry. Among the several well-developed synthetic methods, reductive amination of carbonyl compounds utilizing NH_3 and H_2 as an abundantly available nitrogen source and stoichiometric reductants, respectively, is an intriguing approach for the synthesis of primary amines. In this regard, the present study focuses on the development of metal supported ZrO_2 with different crystal facets for the reductive amination of biomass derived furfural to furfurylamine. The decisive role of presence of surface oxygen vacancies on the catalyst surface towards the intermediate adsorption, resulting into primary amine formation, has been investigated using controlled experiments and advanced techniques such as XPS and EPR. In addition, the catalyst has been further explored through various characterization techniques, such as BET, HR-TEM, XRD, FE-SEM, NH_3-TPD, Raman analysis and poisoning studies.

PP31. CATALYTIC OXIDATION OF 5-HMF TO 2,5-FDCA OVER METAL LOADED BIOMASS DERIVED GRAPHENE OXIDE USING HYDROGEN PEROXIDE

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ABSTRACT

Biomass-derived graphene oxide-supported metal catalysts (Ru@S-GO, Pd@ S-GO, and Pd/Ru@ S-GO) were produced in a tube furnace with a metal loading of 1 weight percent. All the synthesized nano catalysts were well characterized by XRD, FESEM-EDS, ICP-OES, XPS and FTIR, and applied for the *oxidation* of 5-hydroxymethylfurfural (*5-HMF*) to 2,5-furan dicarboxylic acid (FDCA). Hydrogen peroxide was utilized as the liquid oxidant due to its reduced mass transfer resistance. *5-HMF* used in this study was also obtained from biomass. All the operational parameters, such as temperature of the reaction, amount of oxidant, base concentration, and catalyst loading were optimized using Response surface methodology (RSM) based on central composite design (CCD). Ru@S-GO was found to have greater activity and selectivity towards FDCA under benign reaction conditions, and complete conversion of *5-HMF* to 2,5-FDCA was accomplished (98.8% yield) over 5 hours of reaction time in an aqueous medium. Utilization of agricultural waste biomass for the synthesis of precursor *5-HMF* and support material S-GO both, makes the process greener and more economical.

PP32. TRANSCENDENCE OF BICYCLIC (ALKYL)(AMINO) CARBENE (BICAAC) FROM A SPECTATOR LIGAND IN TRANSITION METAL-BASED CATALYST TO AN ORGANOCATALYST: SCRUTINIZING TWO SIDES OF THE SAME COIN

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ABSTRACT

BICAACs discovered by Bertrand and co-workers in 2017, as stable and storable singlet carbenes, have been proven to display enhanced σ-donating and π-accepting properties compared to their CAAC counterparts. Herein, we have utilised Ni-BICAAC complex, $[(MeBICAAC)_2NiBr_2]$ as an active catalyst for carrying out otherwise strenuous reduction via hydrosilylation of various functional groups such as amides, carboxylic acids and ketones to amines, primary alcohols and secondary alcohols, respectively. Various control experiments evince the cleavage of a Si-H bond and in-situ formation of a Ni-H species which clearly demonstrates that the reaction goes through a hydride route and our catalyst acts as a hydride carrier during the course of the reaction. Owing to the favourable steric and electronic properties of the BICAAC and the recent demand for metal-free catalytic systems, we were encouraged to utilise BICAAC directly as a metal-free organocatalyst for carbon-carbon coupling reaction through the direct C-H functionalisation of benzene involving single electron transfer pathway. Here coupling process is initiated by base-promoted HAS as KtOBu activates BICAAC into its radical cation form thereby driving the overall reaction to the product stage.

PP33. SUSTAINABLE INNOVATIVE TECHNOLOGIES TO CATER TO THE GROWING ENERGY NEEDS

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ABSTRACT

Energy savings are critical concern in contemporary society. Renewable energy is one of the most efficient ways to achieve sustainable development. Increasing its share in the world matrix will help prolong the existence of fossil fuel reserves and strengthen the fight against climate change. Development of the global energy industry by 2035 will be primarily focused on meeting the global demand for energy resources for the economical, ecological and societal growth. Aside from the need to provide energy for all of humanity, digitalization and electrification of new sectors of the economy are powerful triggers for the development of the modern energy industry. A huge leap in the technology development is required to maintain the undisturbed operation of the decarbonized power system of the future. Many of the innovative solutions have already been developed or are under development, such as

Rechargeable Tires, Carbon Nanotubes, Lithium-Glass Batteries, 3-D Printed Solar Energy Trees, Food Waste Solar Panels, Liquid Sunlight, Waste-Water Electricity Generator, Artificial Intelligence, Artificial Photosynthesis, etc. Increased demands and innovations have made wind and solar energy one of the cheapest sources, cheaper even than fossil fuels and can make the deepest cuts to CO2 and CFCs. A mostly untapped renewable source of energy is the osmotic pressure difference between seawater of different salinity levels. The purpose of this presentation is to review a comprehensive study of theoretical and practical evolution of innovative technologies in the energy industry through the energy trilemma "energy efficiency – energy security – environmental sustainability".

PP34. TREND ANALYSIS: DESIGNING FOR GREEN CHEMISTRY FUTURE

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ABSTRACT

The material basis of a sustainable society will depend on chemical products and processes that are configured following principles that make them causative to life. Essential inherent properties of molecules need to be considered from the earliest stage—the design stage—to address whether compounds and processes are depleting versus renewable, toxic versus benign, and persistent versus readily degradable. Products, feedstocks, and manufacturing processes will need to integrate the principles of green chemistry and green engineering under an expanded definition of performance that includes sustainability considerations. Green chemistry will be one of the most important fields in the future. Although this field has developed rapidly in the past three decades, it is still at an early stage. Elevating green chemistry is a long-term task, and many challenging scientific and technological issues need to be resolved. Academia and industries need to work together to promote the development of this field. There is no doubt that the development and implementation of green chemistry will contribute greatly to the sustainable development of our society. But to make a transition from green chemistry to sustainable chemistry, the best of the traditions of science and innovation must couple with new emerging systems thinking and systems design that begins at the molecular level and results in a positive impact on the global scale. Further, sustainable chemistry education is a powerful philosophy integrating 'chemistry' into the 'sustainable future' syndrome and offers challenging educational opportunities to achieve identifiable sustainable outcomes.

PP35. A NAPHTHOL-BASED CHEMOSENSOR FOR THE DETECTION OF Pb^{2+} IONS

Yashika Bhatia[1], Jyoti Gaba[1]

[1]*Punjab Agricultural University, Ludhiana*

ABSTRACT

A Naphthol based chemosensor (NCC) was synthesized by reaction of β-naphthol and o-chlorobenzaldehyde in the presence of chlorosulfonic acid in acetonitrile (ACN). The characterization of NCC was done using UV-Visible, 1H-NMR, 13C-NMR, FT-IR, and ESI-MS analysis. The synthesized compound was screened for recognition of different mono, di and trivalent cations including Ag^{+}, Hg^{+}, K^{+}, Li^{+}, Ba^{2+}, Hg^{2+}, Ca^{2+}, Co^{2+}, Cu^{2+}, Fe^{2+}, Mn^{2+}, Pb^{2+}, Zn^{2+}, Al^{3+}, Co^{3+}, Cr^{3+} in ACN using UV-Visible Spectroscopy. The UV-Visible spectrum of NCC alone, showed characteristics absorption bands at 230 nm and after the addition of Pb^{2+} ions to the solution of NCC, an increment in the λmax at 230 nm was recorded. The binding constant of the complex thus formed was calculated to be as 1.5×10^{4} M-1 using Benesi- Hildebrand equation. However, addition of other metal ions showed no or minimal changes in the UV- Vis spectra relative to the NCC. The detection limit (LOD) and quantification limit (LOQ) were determined using the titration studies of the probe NCC with different concentrations of Pb^{2+} ions. Based on the Job's plot, a 1:1 coordinating stoichiometry has been observed for binding of Pb^{2+} ions with the NCC. The synthesized probe was found to be effective to capture Pb^{2+} ions upto three alternate cycles and was stable over the pH range of 3 to 11 and temperature range of 5℃ to 45℃.

Dental Sciences

- Dr. Harvansh Singh Judge Institute of Dental Sciences & Hospital

CO-ORDINATORS

Dr. Vishakha Grover

Dr. Mili Gupta

CHASCON - 2023

National Conference on

Global Science for Global Wellbeing

SECTION PROGRAMME (OCTOBER 13, 2023)
DENTAL SCIENCES
Venue: Dr. HSJIDS, Panjab University, Chandigarh

Sectional President Dr. Vishakha Grover 9814277780	Sectional Secretary Dr. Mili Gupta 9814102254
Time	**Program**
9:45 – 10:00	Commencement of Program **Venue:** Lecture Theatre 1, Dr. HSJIDS, PU, Chandigarh.
10:00 – 10:45	**Section Chair:** Professor Deepak Gupta **Speaker:** Dr. Dipika Bansal MBBS, MD, DM (Clinical Pharmacology, PGIMER), MAMS Associate Professor Clinical Research Unit, Department of Pharmacy Practice National Institute of Pharmaceutical Education and Research, SAS Nagar, Punjab ***"Indirect Evidence Generation using Network Analysis in Drug Safety"***
10:45 – 11:30	**Section Chair:** Professor Shefali Singla **Speaker:** Dr. Tulika Gupta Associate Professor, Department of Anatomy, PGIMER, Chandigarh ***"Road to translational research"***
11:30 – 12:00	Tea break
12:00 – 13:00	Oral Presentations (UG/PG) **Venue:** Committee Room, First floor, DHSJIDS, PU, Chandigarh Oral Presentations (UG/PG) **Venue:** PG Seminar Room, Dept. of Periodontics, First floor, DHSJIDS, PU, Chandigarh.
13:00 – 14:00	Lunch
14:30 – 15.30	Oral Presentations (Faculty) **Venue:** Committee Room, First floor, DHSJIDS, PU, Chandigarh. Oral Presentations (UG/PG) **Venue:** PG Seminar Room, Dept. of Periodontics, First floor, DHSJIDS, PU, Chandigarh.

ABSTRACTS OF ORAL PRESENTATIONS

PARTICIPANTS

S. No.	Name of participant	Affiliating institution	Title of abstract
1.	Jyoti Sharma	Department of Microbiology, Dr Harvansh Singh Judge Institute Of Dental Sciences and Hospital, Panjab University, Chandigarh	A case of fungal subungual melanonychia due to dematiaceous fungi
2.	Sonia Bhonchal Bhardwaj	Department of Microbiology, Dr Harvansh Singh Judge Institute of Dental Science and Hospital, Panjab University, Chandigarh	Probiotics and oral health
3.	Ruchi Vashisht	PGIMER Chandigarh	Cryotherapy – An update in endodontic therapy
4.	Ankita Singh	MM College of Dental Sciences and Research, Mullana, Ambala	Wonder materials in Dentistry
5.	Aarushi Sharma	Department of Dental Sciences, Dr Harvansh Singh Judge Institute of Dental Science and Hospital, Panjab University, Chandigarh	Enhancing patient care through interdisciplinary periodontics: Bridging the gaps
6.	Aashi Bhardwaj	Dr Harvansh singh judge institute of dental sciences, Panjab University, Chandigarh	Titanium dental implant bio-tribocorrosion and its toxicological consequences- A review
7.	Ayush Jain	Dr. Harvansh Singh judge institute of dental sciences, Panjab University, Chandigarh	PARPi-FL in early diagnosis of oral cancer
8.	Charu Sabharwal	Dr Harvansh Singh judge dental college and hospital, Panjab University, Chandigarh	Diabetes as a deterioration of dental health
9.	Ibadat Singhal	Dr. Harvansh Singh Judge Institute Of Dental Sciences, Panjab University, Chandigarh	New methods in detection of oral cancer
10.	Ritika Chawla	Dr. Harvansh Singh Judge Institute Of Dental Sciences And Hospital, Panjab University, Sector-25, Chandigarh	Why are we Pro? # Probiotics

11.	Mallika Mangal	Dr. HSJIDS, PU, Chandigarh	Minimal invasive surgical technique: A randomized controlled clinical trial
12.	Mansi	Dr Harvansh Singh Judge Institute of Dental Sciences & Hospital, Panjab University, Chandigarh	Revolutionizing bone grafting: The impact of 3D printing technology
13.	Mansi Mamgain	Dr Harvansh Singh Judge Institute of Dental Sciences & Hospital, Panjab University, Chandigarh	3D printing: A paradigm in reconstructive periodontics
14.	Muskaan Sarwal	Dr. Harvansh Singh Judge Institute of Dental Sciences and Hospital, Panjab University, Chandigarh	Keratinized tissue augmentation by living cellular constructs v/s free gingival graft
15.	Namya Dhalla	Dr. Harvansh Singh Judge Institute Of Dental Sciences, Panjab University, Chandigarh	Vaping & conventional cigarettes – Different products, same danger?
16.	Pridhi Garg	Dr. Harvansh Singh Judge Institute of Dental Sciences and Hospital, Panjab University, Chandigarh	Comparing three full-mouth non-surgical concepts for stage III and IV periodontitis treatment
17.	Rashmi Rana	Dr.Harvansh Singh Judge dental college, Panjab University, Chandigarh	Inimally invasive therapy for reconstruction of lost interdental papilla by using injectable hyaluronic acid filler
18.	Yukti	Dr. H.S.J Institute of Dental Sciences and Hospital, Panjab University, Chandigarh	Teeth whitening: Aesthetic enhancement and oral health
19.	Manisha Ramola	PGIMER Chandigarh	Microbial profiling in oral cancer: Insights from nanopore sequencing analysis
20.	Rashika Garg	Dr. Harvansh Singh Judge Institute of Dental sciences and Hospital, Panjab University, Chandigarh	CRISPR: Still a whisper in dentistry

OP1. A CASE OF FUNGAL SUBUNGUAL MELANONYCHIA DUE TO DEMATIACEOUS FUNGI

Manjula Mehta[1], Jyoti Sharma[1], Sonia Bhonchal Bhardwaj[1], Sukhwinder Singh[2]

[1]Department of Microbiology, Dr Harvansh Singh Judge Institute of Dental Sciences and Hospital, Panjab University, Chandigarh, [2]Department of General Medicine, Dr Harvansh Singh Judge Institute of Dental Sciences and Hospital, Panjab University, Chandigarh

ABSTRACT

Melanonychia is characterized by tan, brown or black pigmentation within the nail unit, the pigment referred to is conventionally melanin. The aetiology of melanonychia ranges from more common benign causes to less common invasive melanomas, fungal melanonychia is rare. Fungal agents can be both dematiaceous and non-Dematiaceous fungi. Diagnosis of fungal melanonychia is difficult because it mimics melanonychia caused by caused by other factors, which are often non-responsive to traditional antifungal therapy. Melanonychia are worrisome as they may stimulate longitudinal melanonychia. We report a case of fungal melanonychia due to dematiaceous fungi which we confirmed mycologically. The fungus was cultured on SDA agar and further confirmed by microscopic identification. The patient responded well to antifungal treatment.

OP2. PROBIOTICS AND ORAL HEALTH

Sonia Bhonchal Bhardwaj[1]

[1]Department of Microbiology, Dr Harvansh Singh Judge Institute of Dental Science and Hospital, Panjab University, Chandigarh

ABSTRACT

Probiotics have been found to be beneficial to the host health by improving the endogenous flora. Traditionally the use of probiotics have been associated with gastrointestinal tract. However recently several investigators have suggested the use of probiotics for *oral health*. Published studies regarding probiotics and their effects on oral cavity cite the use of probiotics in *oral diseases* such as caries, periodontitis, halitosis and oral candidiasis. Most authors have concluded the use of probiotics is associated with improvement in *oral health.*

OP3. CRYOTHERAPY – AN UPDATE IN ENDODONTIC THERAPY

Ruchi Vashisht[1]

[1]PGIMER Chandigarh

ABSTRACT

Post operative pain after root canal treatment is a major problem for both patient and clinician. It is multifactorial and is a consequence of acute periapical inflammation in response to mechanical, chemical or microbiological insult of tissues during or after root canal treatment .Therefore pain management during and after root canal treatment is one of the most important aspects of endodontic practice. Several strategies have been developed for post operative pain management including analgesics, corticosteroids, administering long lasting anesthesia. Cryotherapy is a long standing technique that has been frequently applied for pain management and post operative care. It refers to decreasing the tissue temperature for

therapeutic purposes. Cryotherapy has been reported to be used after periradicular surgeries and during root canal treatment to minimize post operative pain and inflammation. The mechanism of action and effectiveness of cryotherapy are well described however strong evidence to support its conclusion is limited besides standardization of factors such as duration, application mode. Several studies have assessed the role of cryotreated sodium hypochlorite as an irrigant in post operative pain reduction but as herbal and natural products have gained research interest worldwide in recent years due to their medicinal properties which have favoured their use in endodontics as root canal irrigants. Their use becomes even more significant when handling infected endodontic cases where a plethora of microbes is invading the root canal system. The aim of review is to give brief description of role of cryotherapy in endodontics along with role of herbal products.

OP4. WONDER MATERIALS IN DENTISTRY

Ankita Singh[1]

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ABSTRACT

National Nanotechnology Initiative defines nanotechnology as the direct manipulation of materials at the nanoscale. It deals with the procedures where particles of one billionth of a meter size are put to use. This molecular-level engineering has provided new solutions for treating dental problems, to create advanced materials, to develop new tools for diagnosing and treating dental diseases. The growing interest in the dental applications of nanotechnology since 2000 has led to the emergence of a new field called nanodentistry.

Nanodentistry helps in attaining good oral health while using nanomaterials, nanorobots, nanoneedles, bone graft materials, nanocomposites, nanoparticles like nanotubes, nanopores, nanofibers, nanoplates, nanodots, nanowires, nanobelts, nanorods, nanospheres and nano capsules. Nanomaterials constituents are less than 100 nm. As the particle size decreases at the nanoscale, the physical properties of particles can be altered, and features like resistance, conductivity, durability, lightness, reactivity and longevity are gained. In this way, it can be used to create better products.

The number of dental nanomaterials has increased significantly over the past years. In the near future, it is believed that nanotechnology will completely change the clinical dental practice and delivering oral healthcare to the patients will become less stressful. The present poster gives an overview about the nanotechnology, nanomaterials and its applications, especially in the field of Prosthodontics. We will also look at how the use of nanotech in dentistry has been growing over the years, and talk about the potential future implications and challenges of nanotechnology.

OP5. ENHANCING PATIENT CARE THROUGH INTERDISCIPLINARY PERIODONTICS: BRIDGING THE GAPS

Aarushi Sharma[1]

[1]*Department of Dental Sciences, Dr Harvansh Singh Judge Institute of Dental Science and Hospital, Panjab University, Chandigarh*

ABSTRACT

"Interdisciplinary collaboration is like a symphony; each instrument plays a unique role, but together, they create a masterpiece." This presentation delves into the dynamic world of Interdisciplinary Periodontics, where the seamless integration of periodontal expertise with various dental specialties unlocks new dimensions in patient care. 'CHASCON 2023' itself focuses on the theme "Global Science for Global Wellbeing" which manifests the spirit of 'Vasudhaiva Kutumbakam' (the world is one family) and it is only necessary to carry forward this thought to the field of dental sciences. The rapid evolution of dental technology, development of high-quality biomaterials and increased awareness of dental health has led to a demand for more complex and comprehensive dental treatments. This requires holistic management and requires clinicians to follow a 'merge to emerge' approach of interdisciplinary Periodontics. The session explores the benefits of synergistic care for patients through a series of real-world case studies highlighting successful interdisciplinary approaches. Attendees will gain an insight on how combined efforts between periodontists, orthodontists, prosthodontists, endodontists and oral surgeons can result in superior patient outcomes. These outcomes include early diagnosis, faster recovery rates, better infection control and completeness of care. The presentation ends looking forward to the emerging role of Artificial Intelligence (AI) and Telehealth in collaborative care.

OP6. TITANIUM DENTAL IMPLANT BIO-TRIBOCORROSION AND ITS TOXICOLOGICAL CONSEQUENCES- A REVIEW

Aashi Bhardwaj[1]

Dr Harvansh Singh Judge Institute of Dental Science and Hospital, Panjab University, Chandigarh

ABSTRACT

The term "bio-tribocorrosion" refers to a phenomenon that combines microbiological activities with the fundamentals of corrosion and tribology (friction, wear, and lubrication). Recently it has received more attention in implant dentistry because titanium particles and degradation products of titanium have been detected in oral and nonoral tissues upon exposure to various microbial, biochemical, and electrochemical factors in the oral cavity. This review discusses the toxicological effects of the bio-tribocorrosion of titanium (Ti) dental implants in the oral cavity in terms of factors that contribute to the tribocorrossion of dental implants such as type of Ti, oral biofilm, acidic pH, fluorides, and micromovements during mastication along with their adverse effect such as peri-implantitis, allergies, and hypersensitivity reactions by promoting inflammatory processes and bone degradation in the surrounding tissues.

OP7. PARPI-FL IN EARLY DIAGNOSIS OF ORAL CANCER

Ayush Jain[1], Avinash Krishna V[1]

Dr Harvansh Singh Judge Institute of Dental Science and Hospital, Panjab University, Chandigarh

ABSTRACT

Oral cancer is the sixth most common type of cancer with India contributing to almost one-third of the total burden and the second country having the highest number of oral cancer cases. Oral squamous cell carcinoma (OSCC) dominates all the oral cancer cases. Tobacco consumption including smokeless tobacco, betel-quid chewing, excessive alcohol consumption, unhygienic oral condition, and sustained viral infections that include the human papillomavirus are some of the risk aspects for the incidence of oral cancer. Various conventional clinical techniques such as physical and histopathological examination, staining, biopsy, spectroscopic and radiological techniques, etc. are used routinely to detect oral cancer. The diagnosis of cancer in the early stage is a key factor to check further physical, psychological, and financial losses to the patient. Upon early diagnosis, timely and proper treatment can be initiated that may improve the survival rate up to 90%, One such advancement is PARP 1 targeted optical imaging agent for early diagnosis of oral cancer. Nuclear enzyme Poly(ADP-ribose)Polymerase 1 (PARP1) is a promising target for optical imaging of OSCC with the fluorescent dye PARPi-FL. In patient-derived OSCC specimens, PARP1 expression was increased 7.8 ± 2.6-fold when compared to normal tissue. Intravenous injection of PARPi-FL allowed for high contrast in vivo imaging of human OSCC models in mice with a surgical fluorescence stereoscope and high-resolution imaging systems. The emitted signal was specific for PARP1 expression and, most importantly, PARPi-FL can be used as a topical imaging agent, spatially resolving the orthotopic tongue tumors in vivo.

OP8. DIABETES AS A DETERIORATION OF DENTAL HEALTH

Charu Sabharwal[1]

[1]*Dr Harvansh Singh Judge Institute of Dental Science and Hospital, Panjab University, Chandigarh*

ABSTRACT

Diabetes has taken a troll over the world effecting not only the systemic health but also the dental health on a major scale. This presentation would discuss the, risk factors and effects of diabetes on oral health, the bidirectional relationship between diabetes and periodontium and special instructions for diabetic patients to maintain their oral health.

OP9. NEW METHODS IN DETECTION OF ORAL CANCER

Ibadat Singhal[1], Shally Gupta[1]

[1] *Dr Harvansh Singh Judge Institute of Dental Science and Hospital, Panjab University, Chandigarh*

ABSTRACT

Cancer is a multifaceted disease and the treatments and has become fatal due to its poor prognosis, high recurrence rate and insufficient screening modalities. The modern techniques

are introduced to comprehend the genetic susceptibility of individuals for oral cancer, to predict the disease course and identify genetic links to develop cancer vaccines. Various latest techniques have become popular for cancer detection and they are enlisted below. 1) **Proteomics-**Cancer proteomics takes identification and quantitative analysis of differentially expressed proteins in comparison to healthy tissue counterparts from stage of pre-neoplasia to neoplasia. 2) **Polymerase Chain Reaction (PCR) 3) Micro Arrays-**This technique is used in gene profiling for predicting malignant transformation of oral pre-malignant lesions. 4) **Tissues Florescent Imaging (Velscope System)**- It is the use of tissue autofluorescence for diagnosis of dysplastic lesions in oral cavity. 5) **Optical Coherence Tomography (OCT)**- It is a non-invasive real time imaging modality and is also referred to as optical biopsy. 6) **Oral Cancer Screening Using Microfluidics or Lab on a Chip (LOC) Or Micro Total Analysis Method-** It is the integration and automation of analytical laboratory procedures into a single device on a chip. It is a non-invasive, short duration, consistent and economical process. 7) **Artificial Intelligence In Cancer Detection** 8) **Nanotechnology**-: A) **Magnetic Resonance Imaging** (**MRI**) B) **Photoacoustic Imaging** C) **Surface Plasma Resonance Scattering** D) **Surface Enhanced Raman Spectroscopy** E) **Diffusion Reflection Imaging** F) **Quantum Dots Imaging** G) **Nano Based Ultrasensitive Biomarker Detection**

OP10. WHY ARE WE PRO? # PROBIOTICS

Kavya Khurana[1], Ritika Chawla[1]

[1]*Dr. Harvansh Singh Judge Institute of Dental Sciences and Hospital, Panjab University, Chandigarh*

ABSTRACT

Once Jke Skelton stated that -" Modern medical advances have helped millions of people live longer and healthier lives. We owe these improvements to decades of investment in medical research". It keeps on bringing novel inventions or products for better health outcomes. Probiotics are such a newer addition which have also become a matter of attraction for researchers in recent times. These are the dietary supplements which have been advocated for the prevention and treatment of wide range of diseases. Since majority of the infections and diseases are microbial associated with anti - infective treatment being the most admirable. Now the time has arrived to shift treatment strategy from bacterial elimination to altering bacterial ecology. This review focuses to help scientific community to keep abreast of recent trends in the use of probiotics in dentistry.

OP11. HUMAN INTRABONY DEFECT REGENERATION WITH AUTOLOGOUS DENTAL PULP STEM CELLS MICROGRAFTS USING MINIMAL INVASIVE SURGICAL TECHNIQUE: A RANDOMIZED CONTROLLED CLINICAL TRIAL

Mallika Mangal[1]

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ABSTRACT

The aim of this study was to evaluate enhancement of clinical and radiographic parameters of periodontal regeneration by using dental pulpal stem cells (DPSCs) micrografts in collagen scaffold delivered into intrabony defects via Minimal Invasive Surgical Technique (MIST). Results: Test sites exhibited significantly more probing depth (PD) reduction (4.9 mm versus 3.4 mm), clinical attachment level (CAL) gain (4.5 versus 2.9 mm) and bone defect fill (3.9 versus 1.6 mm) than controls. Moreover, residual PD < 5 mm (93% versus 50%) and CAL gain ≥4 mm (73% versus 29%) were significantly more frequent in the test group. Conclusions: Application of DPSCs significantly improved clinical parameters of periodontal regeneration 1 year after treatment.

OP12. REVOLUTIONIZING BONE GRAFTING: THE IMPACT OF 3D PRINTING TECHNOLOGY

Pratik Singh[1], Mansi[1]

[1]*Dr. Harvansh Singh Judge Institute of Dental Sciences and Hospital, Panjab University, Chandigarh*

ABSTRACT

"Revolutionizing Bone Grafting: The Impact of 3D Printing Technology" The profound quote by Daniel Bell, "Technology like art, is a soaring exercise of the human imagination," holds true in the context of 3D printing's remarkable influence on the healthcare sector. This presentation delves into the captivating realm of 3D printing, specifically focusing on its pivotal role in bone grafting-a critical procedure in reconstructive surgery. In the realm of bone grafting, 3D printing technology has emerged as a game-changer, profoundly impacting patient preparation for surgery and likelihood of transplant rejection, while also addressing various complications arising during the procedure. We aim to provide an insightful review of the multifaceted role of 3D printing in bone grafting. We will explore the advanced technologies and materials that bolster the 3D printing process, discussing their respective advantages and disadvantages. Notably, 3D printing has found its niche in bone tissue engineering-a groundbreaking technique for treating complex bone defects. By creating personalized, porous scaffolds with ideal mechanical strength and micro-macrostructures tailored to individual patients, this technology has opened new frontiers in regenerative medicine. Central to this approach is the strategic use of biomaterials, playing pivotal role in facilitating cell & tissue regeneration. Through this article, we will understand how 3D printing's integration with bone grafting is revolutionizing the healing process for patients with various bone defects. The promise and potential of 3D printing technology within the

biomedical field are vast, and we anticipate that this intersection will be a hallmark of modern medicine.

OP13. 3D PRINTING: A PARADIGM IN RECONSTRUCTIVE PERIODONTICS

Mansi Mamgain[1]

[1]*Dr. Harvansh Singh Judge Institute of Dental Sciences and Hospital, Panjab University, Chandigarh*

ABSTRACT

Periodontal regenerative therapies attempt to manage the destructive periodontal disease by formation of new periodontal structures which have been lost due to the disease process. Advancements in 3D printing technology offers innovative solutions through regenerative periodontics to restore oral health and enhance patient outcomes. It focuses on its applications in tissue engineering, custom implant fabrication, and treatment planning. It enables the precise fabrication of patient-specific scaffolds and membranes, revolutionizing tissue regeneration. This personalized approach minimizes the risk of graft rejection and enhances the overall success of regenerative procedures. Objective: The use of bone grafts, GBR and GTR has resulted in predictable results in the periodontal therapy but the search for ideal material use of which causes healing through the reconstitution of a new periodontium is still ongoing. Conclusion: The advent of 3D Printing/ bioprinting and its incorporation in periodontal regenerative therapy provides a new paradigm in the management of destructive periodontal diseases, offering a range of tools and solutions that improve patient care. By harnessing the potential of 3D printing technology, periodontists can elevate the precision, efficacy, and overall success of regenerative procedures, ultimately leading to improved oral health and patient satisfaction.

OP14. KERATINIZED TISSUE AUGMENTATION BY LIVING CELLULAR CONSTRUCTS V/S FREE GINGIVAL GRAFT

Muskaan Sarwal[1]

[1]*Dr. Harvansh Singh Judge Institute of Dental Sciences and Hospital, Panjab University, Chandigarh*

ABSTRACT

Aim of this study is to evaluate the long-term outcomes and assess the changes occurring since the end of the original 6-month study. A 13-year follow-up was conducted of a short-term investigation of the use of living cellular construct (LCC) versus free gingival graft (FGG) for keratinized tissue width (KTW) augmentation in natural dentition. The longitudinal mixed model analysis showed that FGG delivered significantly better clinical outcomes over 13 years. LCC-treated sites exhibited superior aesthetic outcomes compared to FGG-treated sites at 6 months and 13 years. In the study nine sites per group were found to have maintained stable clinical outcomes from 6 months to 13 years. No significant differences were observed for the clinical parameters between LCC and FGG from 6 months to 13 years. Superior clinical

outcomes were found for FGG over 13 years, while LCC was associated with better esthetics and patient-reported outcomes than FGG.

OP15. VAPING & CONVENTIONAL CIGARETTES – DIFFERENT PRODUCTS, SAME DANGER?

Namya Dhalla[1], Navneet K. Hundal[1], Tanvi Mittal[1]

[1]*Dr. Harvansh Singh Judge Institute of Dental Sciences and Hospital, Panjab University, Chandigarh*

ABSTRACT

Electronic cigarettes or vape are battery-operated devices, that heat up a special liquid into an aerosol that users inhale, which is thick and viscous, gets retained on the oral tissues causing periodontal problems, development of caries, and other oral health effects. The increase in use of these electronic cigarettes amongst the youth, the lack of knowledge about its potential as a harmful substance in the short and long term, and the people's belief of this being a safer option than conventional cigarettes without enough research and evidence is concerning. This study will be conducted to understand the beliefs and opinions of the youth on vaping, and gathering information about the ease of availability, frequency & the ill effects of its use on oral health. A cross–sectional web study will be conducted on 250 college students and working professionals in India from August to September '23 through WhatsApp and drs using the 15 points Google assessment tool. The source for questionnaire is www.surveymonkey.co.uk. The college students and working professionals within 18 to 25 years will be included. While those who did not wish to participate were excluded from this study. Appropriate statistics will be employed. Overall results will be calculated. Our study will be the first to analyse and comprehend the reasons for its increasing popularity, to understand the psyche behind its addiction, and predict based on existing research that whether it's a safer or worse option than using conventional cigarettes, in the short as well as long run.

OP16. COMPARING THREE FULL-MOUTH NON-SURGICAL CONCEPTS FOR STAGE III AND IV PERIODONTITIS TREATMENT

Pridhi Garg[1]

[1]*Dr. Harvansh Singh Judge Institute of Dental Sciences and Hospital, Panjab University, Chandigarh*

ABSTRACT

Aim of this study is to evaluate evaluate the clinical efficacy of full-mouth scaling (FMS), full-mouth disinfection (FMD), and FMD with adjuvant erythritol air-polishing (FMDAP) compared to quadrant-wise debridement (Q-SRP) in patients with periodontitis stage III/IV. Mechanical debridement using subgingival scaling and root planing (SRP) can unequivocally be considered as a well-established and effective method for causal non-surgical therapy of periodontitis. Patients treated with FMD had significantly greater PPD reduction in deep pockets and a higher percentage of pocket closure after 3 months but not after 6 months compared to Q-SRP. CAL and BOP changes did not significantly differ among all groups. Efficiency of treatment was significantly higher for FMDAP, FMD, and FMS compared to Q-

SRP. FMDAP showed improved clinical outcomes over Q-SRP for moderate and deep pockets after 6 months. Full-mouth protocols were more time-efficient than conventional Q-SRP.

OP17. INIMALLY INVASIVE THERAPY FOR RECONSTRUCTION OF LOST INTERDENTAL PAPILLA BY USING INJECTABLE HYALURONIC ACID FILLER

Rashmi Rana[1]

[1]*Dr. Harvansh Singh Judge Institute of Dental Sciences and Hospital, Panjab University, Chandigarh*

ABSTRACT

Interdental papilla represents a small visible area present in-between teeth and gingiva of the oral cavity. Interdental papilla plays an important role in esthetics due to its strong association with the patient smile. Gingival black triangle (GBT) is a cosmetic deformity which refers to an absence of papilla resulting in black spaces or open embrasures which impairs esthetic feature, phonetics problems and food accumulation. Hence several surgical techniques have been constantly proposed and experimented, they are mostly invasive and unpredictable. Moreover, the success rate of surgical augmentation of papilla relies on the thickness of gingiva biotype. Hence, we had focused on minimally invasive periodontal therapy as a safer and convenient therapeutic approach. Becker et al., in 2010, first used injectable hyaluronic acid (HA) filler to treat papillary recession and showed a promising result. The aim of this present study was to evaluate the efficacy of injectable HA filler for the reconstruction of IDP (Interdental Papilla) as well as to evaluate its handling property.

OP18. TEETH WHITENING: AESTHETIC ENHANCEMENT AND ORAL HEALTH

Yukti[1]

[1]*Dr. Harvansh Singh Judge Institute of Dental Sciences and Hospital, Panjab University, Chandigarh*

ABSTRACT

The primary aim of this study is to disseminate information to the general populace concerning the cosmetic enhancement of dentition through the process of dental bleaching/whitening, accompanied by a comprehensive evaluation of its repercussions on overall oral health. Furthermore, this study will encompass an examination of recent advancements in the field of dental whitening. Sources: An exhaustive electronic inquiry was undertaken. Pertinent data were extracted from scholarly databases such as PubMed and Scopus. Supplementary bibliographic resources were procured from reputable sources including Wikipedia, the NHS, and ScienceDirect. Keywords: The key search terms utilized in this study include "teeth bleaching," "teeth whitening," "whitening methods," and "bleaching effects." Conclusions: Dental whitening confers a multitude of advantages, predominantly affording psychological well-being to patients; however, it is not without its associated caveats. The process of bleaching, when executed in accordance with precise guidelines and a thorough consideration of potential side effects, remains an acceptable modality for dental enhancement.

OP19. MICROBIAL PROFILING IN ORAL CANCER: INSIGHTS FROM NANOPORE SEQUENCING ANALYSIS

Manisha Ramola[1], Shipra Gupta[1], Archana angrup[1], Tanvi Vashist[1]
[1]*PGIMER Chandigarh*

ABSTRACT

There exists sufficient literature to suggest a causal relationship between the development of certain malignancies and bacterial infections. In particular, oral microbial dysbiosis has been reported to be associated with oral carcinogenesis. B. Methods Tumor tissues, adjacent clinically healthy tissue and saliva samples of oral cancer patients were collected to assess the prevalence and relative abundance of the microbes utilizing 16S targeted Oxford Nanopore Technology (MinION Oxford Nanopore Technology). The samples were collected in thioglycolate broth and subsequently subjected to DNA extraction using Qiagen DNeasy Blood and Tissue kit. Samples positive for pan-bacterial 16S rRNA were selected for the metagenomics analysis which consists of DNA library preparation, nanopore sequencing and finally sequencing data analysis using bioinformatic tools and statistical analysis. C. Results and conclusions Results: *Fusobacterium nucleatum* was found in more abundance in all types of samples as compared to the more notorious *Porphyromonas gingivalis*. A significant decrease in the alpha diversity was found in the tumor and saliva tissue compared to the normal tissue. Some taxa including *Eikenella* and *Selenomonas* were identified differentially in the tumor tissue than the other samples of the subject. Conclusion: The current findings have possible implications for the early detection of oral cancer. Based on these early findings, an association can be drawn between potentially putative oral microbiota and that recovered from oral cancer lesions, thereby emphasizing the significant role of periodontal health and its maintenance for the population at large.

OP20. CRISPR: STILL A WHISPER IN DENTISTRY

Rashika Garg[1], Rashmi Kumari[1]
[1] *Dr. Harvansh Singh Judge Institute of Dental sciences and Hospital, Panjab University, Chandigarh*

ABSTRACT

Genome editing is a method for making changes to the DNA of a cell or organism. These technologies enable the scientists to remove, add or replace the DNA after cutting at a specific spot. Human genome editing can be used on germline cells or somatic cells. Germline therapies change DNA in reproductive cells which is passed from generation to generation. Somatic therapies target on non-reproducible cells whose changes are effective only on the person receiving the therapy. Among various technologies, most commonly used are clustered regularly interspaced short palindromic repeats (CRISPR/Cas9), transcription activator-like effector nucleases (TALENs), zinc-finger nucleases (ZFNs) and meganucleases. CRISPR is simpler, faster, cheaper and more accurate method extending into whole genome screening, both in loss-of-function and gain-of-function manners. It is a family of DNA sequences found in the genome of prokaryotes that play a pivotal role in their anti-viral defense and provide adaptive immunity. This technology opens a whole new realm of therapeutic and treatment strategies in dentistry. By identifying causative organisms or faulty genes, CRISPR can help

in diagnosing and treating various oral pathologies such as periodontal diseases, caries, orofacial clefts, tooth agenesis, head and neck cancers, orofacial pain and TMJ disorders. Treatments involving CRISPR would consider patient's genetic makeup, environmental factors and other characteristics that may predispose the patient to certain disease.

ABSTRACTS OF POSTER PRESENTATIONS

PARTICIPANTS

S. No.	Name of participant	Affiliating institution	Title of abstract
1.	Ishi Soni	Dr. Harvansh Singh Judge Institute of Dental Sciences and Hospital, Panjab University, Chandigarh	Transforming dental healthcare: The role of artificial intelligence in dentistry
2.	Manjot Kaur, Nayana Gupta	Dr. Harvansh Singh Judge Institute of Dental Sciences and Hospital, Panjab University, Chandigarh	AI in dentistry
3.	Ritika Khurana	Dr. Harvansh Singh Judge Institute of Dental Sciences and Hospital, Panjab University, Chandigarh	Tooth impaction
4.	Vritti Piplani	Bhojia Dental college and hospital, Baddi	Immediate dental implant placement: A revolution in oral implantology

PP1. TRANSFORMING DENTAL HEALTHCARE: THE ROLE OF ARTIFICIAL INTELLIGENCE IN DENTISTRY

Ishi Soni[1], Dimitri Chandra Shah[1]

[1]*Dr. Harvansh Singh Judge Institute of Dental Sciences and Hospital, Panjab University, Chandigarh*

ABSTRACT

The field of dentistry has witnessed a remarkable transformation in recent years, driven by the integration of artificial intelligence (AI) technologies. This abstract explores the burgeoning impact of artificial intelligence in dentistry, highlighting its multifaceted applications and potential benefits. AI-driven tools and techniques have revolutionized diagnostic, treatment planning, and patient care processes, enhancing precision, efficiency, and patient outcomes. This abstract dwells into AI's role in image analysis, dental record management, treatment recommendations how it is reshaping the dental landscape. Furthermore, we discuss the challenges and ethical considerations associated with AI implementation in dentistry and propose future directions for research and development. The integration of AI in dentistry is poised to enhance both the practice of dentistry and the overall oral health of individuals, offering a promising paradigm shift in dental healthcare. Future aims of AI research in dentistry sector include not only raising the performance of AI models to expert levels but also detecting early lesions that are invisible to the human eye. In dentistry, AI has been adopted in all dental disciplines, i.e., operative dentistry, periodontics, orthodontics, oral and maxillofacial surgery, and prosthodontics. The majority of the AI applications in dentistry go to the diagnosis based on radiographic or optical images AI technologies can help professionals provide their patients with high-quality dental treatment. Dentists may employ AI systems as a supplemental tool to improve the precision of diagnosis, treatment planning, and treatment result prediction.

PP2. AI IN DENTISTRY

Manjot Kaur[1], Nayana Gupta[1]

[1]*Dr. Harvansh Singh Judge Institute of Dental Sciences and Hospital, Panjab University, Chandigarh*

ABSTRACT

Artificial Intelligence is a technology that utilizes machines to mimic intelligent human behavior. With recent progress in digitized data acquisition, machine learning and computing infrastructure, AI applications are expanding into areas that were previously thought to be reserved for human experts. When applied to medicine and dentistry, AI has tremendous potential to improve patient care and revolutionize the health care field. In dentistry, AI is being investigated for a variety of purposes, specifically identification of normal and abnormal structures, diagnosis of diseases and prediction of treatment outcomes. This review describes some current and future applications of AI in dentistry. Artificial intelligence appeared as a reliable modality to enhance future implications in the various fields of dentistry, i.e., diagnostic dentistry, patient management, head and neck cancer, restorative dentistry, prosthetic dental sciences, orthodontics, radiology, and periodontics. As to what the future of AI will be in dentistry, in the future, we expect that dental clinics will establish an Al-

Comprehensive Care System. Before each appointment, the Al patient history analyzer will evaluate the planned treatment with the patient's gender, age, vital signs, medical history, current medications, and health condition.

PP3. TOOTH IMPACTION

Ritika Khurana[1]

[1]*Dr. Harvansh Singh Judge Institute of Dental Sciences and Hospital, Panjab University, Chandigarh*

ABSTRACT

An impacted tooth is one which is completely or partially unerupted, is positioned against another tooth, bone or soft tissue so that its further eruption is unlikely and described according to its anatomic position. Mandibular 3rd molars are the most commonly impacted teeth followed by the maxillary 3rd molars, maxillary canine, mandibular premolar, maxillary premolar, mandibular lateral incisor, maxillary lateral incisor, maxillary central incisor and mandibular canine. This review presentation will highlight the potential complications associated with untreated tooth impaction, such as pain, infection, and damage to adjacent teeth & structures. The classification of impacted teeth given by WINTERS as well as PELL AND GREGORY has also been focused upon as it helps in defining the type and degree of retention, as well as assessing the degree of difficulty in surgical removal of impacted teeth. Along with this, both intraoral & extraoral radiographs have been included that aid in the assessment of the density of surrounding bone, maxillary sinus approximation and the nature of the overlying tissue. Furthermore, the diverse treatment options available for managing tooth impaction, including surgical extraction have been elaborated upon as well, to prevent potential complications that can cause severe discomfort to the patient. By the end of this presentation the attendees will get a thorough understanding of tooth impaction, its underlying causes, the potential complications it poses and various treatment options available.

PP4. IMMEDIATE DENTAL IMPLANT PLACEMENT: A REVOLUTION IN ORAL IMPLANTOLOGY

Vritti Piplani[1], Yamika Thakur[1]

[1]*Bhojia Dental College and Hospital, Baddi*

ABSTRACT

An artificial device called a dental implant is surgically inserted into the oral tissues, usually made of synthetic materials, beneath the mucosal and/or periosteal layers and within the bone. Its main function is to offer stability and support for a fixed or removable prosthesis. Before attaching the prosthesis to it a period of time is necessary for osseointegration, which is direct and apparent connection of bone tissue to an inert synthetic material, without the presence of intervening connective tissue. There are various approaches to dental implant placement following tooth extraction, including immediate placement right after extraction, delayed immediate placement (within two weeks to three months after extraction), and late implantation (three months or more after tooth removal). Immediate implant placement has gained popularity in recent years and has evolved significantly. This approach is advisable

when the extraction socket is in good condition yielding favorable long-term results. In cases where there are pre-existing or post-extraction bone defects it is recommended to employ bone regeneration techniques. Initially limited to healthy sites, immediate implant placement can now be performed even in infected sites with reduced periodontal support, although some precautions are required This poster seeks to provide a comprehensive overview of IPP, latest developments in this field, emphasize the key factors that ensure optimal outcomes, and summarize the scenarios in which this technique is appropriate.

Earth and Environmental Sciences

- Geology
- Geography
- Environment Studies

CO-ORDINATORS

Dr. Seema Singh

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CHASCON - 2023

National Conference on

Global Science for Global Wellbeing

SECTION PROGRAMME (OCTOBER 13, 2023)
EARTH AND ENVIRONMENTAL SCIENCES
Venue: Department of Geology and Geography, Panjab University, Chandigarh

Sectional President Dr Seema Singh +91-8360382708, +91-7696058201	Sectional Secretary Dr. Vishwa Bandhu Singh +91-9872833637

Time	Program
9:00 – 9:45	Display of Posters – UG/PG and Research Scholars Venue: Ground Floor Corridor, Department of Geology
9:45 – 11:30	**Session Chair:** Professor Naresh Kumar **Speaker:** Professor Anoop Ambili Department of Earth & Environmental Sciences, IISER, Mohali ***"Lipid Biomarkers: Molecular Tools for Understanding Climate-Human-Fire Dynamics"*** **Speaker:** Dr. Monmohan Singh Director, India Meteorological Department (IMD), Chandigarh ***"Extreme Weather Phenomenon over Northwest India in view of Global Warming Scenario"***
11:30 – 12:00	Tea break
12:00 – 13:00	**ORAL PRESENTATIONS (FACULTY)** **Venue: Seminar Hall, Ground Floor, Department of Geology** 1. ***Geochemistry of Anorogenic Acid Volcano-Plutonic Rocks from Neoproterozoic Tusham Ring Complex, NW Indian Shield: Constraints on Radioactive, Trace and Rare Earth Element Distributions*** Dr. Naresh Kumar, Naveen Kumar [1] Department of Geology, Kurukshetra University, Kurukshetra, Haryana 2. ***Contribution Of Environment Protection Act 1986: An Analytical Study*** Dr. Ritu Salaria UILS/LAW, Panjab University SSG Regional Centre, Hoshiarpur
13:00 – 14:00	Lunch
14:00 – 15.30	**ORAL PRESENTATIONS (RESEARCH SCHOLARS)** **Venue:** Seminar Hall, Ground Floor, Department of Geology Chair: Prof Rajiv Patnaik; Co-Chair: Dr Rajiv Kumar **ORAL PRESENTATIONS (UG/PG STUDENTS)** **Venue:** Seminar Hall, Department of Geography (2nd Floor) Chair: Prof Krishna Mohan; Co-Chair: Dr Madhuri Rishi
15:30 – 16:00	Tea break
16:00 onwards	**POSTER PRESENTATIONS** **(RESEARCH SCHOLARS/UG/PG STUDENTS)** **Venue:** Ground Floor Corridor, Department of Geology Chair: Prof Ashu Khosla; Co-Chair: Prof Gaurav Kalotra

ABSTRACTS OF ORAL PRESENTATIONS

PARTICIPANTS

S. No.	Name of participant	Affiliating institution	Title of abstract
1.	Ritu Salaria	UILS/LAW, Panjab University SSG Regional Centre, Bajwara, Hoshiarpur	Contribution of Environment Protection Act 1986: An analytical study
2.	Naresh Kumar	Department of Geology, Kurukshetra University, Kurukshetra, Haryana, India	Geochemistry of anorogenic acid volcano-plutonic rocks from Neoproterozoic Tusham Ring complex, NW Indian shield: Constraints on radioactive, trace and rare earth element distributions
3.	Ashish Kumar	Department of Geography, Panjab University Chandigarh	Forest landscape transformation in the Western Himalayan region of Chamba district, Himachal Pradesh
4.	Deepa	University Institute of Fashion Technology and Vocational Development, Panjab University	Sustainability in fashion: A designer and brand's perspective
5.	Karan Tewari	Department of Environment Studies, Panjab University, Chandigarh, India	Assessment of groundwater quality with reference to its potability in parts of Siwalik region, Northwest India
6.	Manmeet Kour	Department of Environment Studies, Panjab University, Chandigarh 160014, India	Bioplastic production from fruit and vegetable processing waste for bioactive packaging applications
7.	Raj Kiran Dhiman	Department of Geology, Panjab University, Sector 14, Chandigarh, India	A new rockfall propagation model: Examining rockfall risk in Manikaran, NW Himalaya, India
8.	Ramkrishna Mondal	Department of Geology, Panjab University	Assessment, characterizations and

			physical enrichment of lithium from major coal-field of Assam state, NE India
9.	Shivam Sharma	Panjab University Chandigarh	Mode of occurrence of rare earth elements in different grades of Indian coal
10.	Vishal Bajala	Department of Environment Studies, Panjab University, India	Implications of land use activities and landslides on geodiversity of Parbati river Basin, North-western Himalayan region, India
11.	Maya Negi	Department of Geography, Panjab University	Mapping the traditional cultural landscape. An initiative towards heritage conservation and cultural sustainability
12.	Aditya K. Verma	CSIR-CSIO	The impact of active tectonics on earthquakes and landslides in north India: A review of recent research
13.	Megha Latwal	Department of Botanical and Environmental Sciences, Guru Nanak Dev University, Amritsar - 143005, Punjab, India	Assessment of air pollution tolerance and performance of some plant species growing in public parks
14.	Swati Rana	Department of Geology ,Kurukshetra university, Kurukshetra	Geochemical and petrological study of meta sedimentary and meta igneous rocks of Nasibpur and surrrounding areas, North Delhi fold belt, NW India : Insights into fluid-rock exchange processes
15.	Aakansha Sharma	Department of Geology, Panjab University	A comprehensive examination of water quality deterioration and heavy metal contamination in Buddha Nala, Punjab

16.	Kanishka Negi	Department of Geology, Panjab University	The great Himalayan earthquake
17.	Khushi Arya Singh	Department of Geology, Panjab University, Chandigarh	Landslides in Himalayan mountains of Himachal Pradesh
18.	Manik Lakherwal	Department of Geology, Panjab University	Rockfall modeling approaches: State-of-the-Art review
19.	Mannat Thakur	Department of Geology, Panjab University	Mitigating Himalayan landslide crisis: Saving lives and infrastructure through geological expertise amidst climate change
20.	Prince Pandit	Department of Geology, Panjab University	Groundwater quality analysis in Safidon and Julana block of Jind
21.	Simran Bansal	Department of Geology, Panjab University	Need for mitigation strategies for changing climate in India
22.	Kanchan Yadav	Dept. of Bio-sciences & Technology, MM Engineering College (MMEC), Maharishi	Diesel exhausts, solid waste burning and environmental dioxin increase: High lung cancer threats in the state of Haryana & Punjab

OP1. CONTRIBUTION OF ENVIRONMENT PROTECTION ACT 1986: AN ANALYTICAL STUDY

Ritu Salaria[1]

[1] *UILS/LAW, Panjab University SSG Regional Centre, Bajwara, Hoshiarpur, Punjab, India*

ABSTRACT

The Researcher in this Research paper shall make an analysis of the EP Act 1986 in the Indian Scenario. The preamble of the Act states the objective of the Act to be the protection and improvement of the environment. It seeks to protect human beings, other living creatures, plants, and property from environmental hazards. It extends to the whole of India and aims to prevent, control, and abate environmental pollution. Even though we had the Water Act, 1974, the Air Act, 1981, and the Indian Forest Policy, 1988, there was a pressing need for general legislation with stringent penal provisions in order to safeguard the environmental rights.

OP2. GEOCHEMISTRY OF ANOROGENIC ACID VOLCANO-PLUTONIC ROCKS FROM NEOPROTEROZOIC TUSHAM RING COMPLEX, NW INDIAN SHIELD: CONSTRAINTS ON RADIOACTIVE, TRACE AND RARE EARTH ELEMENT DISTRIBUTIONS

Naresh Kumar[1], Naveen Kumar[1]

[1]*Department of Geology, Kurukshetra University, Kurukshetra, Haryana, India*

ABSTRACT

The rocks of Tusham Ring Complex (TRC) in the NW Indian Shield were investigated for radio-elemental abundances, radiogenic heat production and rare-metal affinities. Rhyolites and granites are observed as major magmatic suites and consist of hypersolvus to subsolvus, peraluminous and high-K calc alkaline to shoshonitic A-type granitoids that are characterized by high SiO2 (59.56-75.73), K2O+Na2O (4.28-9.37), K/Na, Fe/Mg, Ga/Al, Rb/Sr, Th/U, Rb, Zr, Nb, Y, Th, U, REE (except, Eu), halogens (F & Cl) and low CaO (0.03-2.56), MgO (0.07-0.99), Sr, Cr, Ni, P and Eu in abundances. The enrichment of LILE (K, Rb, Ba) and HFSE (Zr, Nb, REE, Th, U), collectively, is attributed to high heat producing (HHP) and rare-metal bearing granitoids. The acid volcanics of Riwasa and Tusham show wide variations of U (4.70-26.10 ppm), Th (19-145 ppm), Th/U (3.56-15.91), Heat production (HP: 3.04-15.30 uWm-3), Heat generation unit (HGU: 7.24-36.3 uWm-2), whereas the granitic massifs of Nigana, Dulheri, Dharan, Khanak, Devsar and Dadam show range of U (2.50-35.60 ppm), Th (17-124 ppm), Th/U (3.93-20 ppm), HP (3.03-16.63 uWm-3), HGU (7.22-39.37 uWm-2), respectively. Moreover, the studied granitoids have much higher values of HP and HGU than the average values of continental crust (3.8 HGU), which indicate a ‘hot crust’ category and a possible linear relationship among the radioactive heat production, surface heat flow, and crustal heat generation in the rocks of TRC. The geochemistry suggests the possibility of important rare metals and rare earth metals (RMREM) mineralization i.e., Sn-W, Nb-Sn, Sn-W-Be, porphyry Cu, U-Th and Rb-Ba.

OP3. FOREST LANDSCAPE TRANSFORMATION IN THE WESTERN HIMALAYAN REGION OF CHAMBA DISTRICT, HIMACHAL PRADESH.

Ashish Kumar[1], Karanjot Kaur Brar[1], Suresh Chand[1]

[1]*Department of Geography, Panjab University Chandigarh, India*

ABSTRACT

Rising population and human activities are straining the Himalayan landscape, making it more vulnerable to change. Research on forest landscape transformation is vital for tackling global issues like deforestation and climate change. This study aims to examine how the forest landscape evolved from 1991 to 2021 due to environmental and human factors. A change detection method was performed by using satellite data Landsat 4-5 TMS, Landsat 7 ETM+ and Landsat 8 OLI data and transformation matrix is generated to determine the nature, extend and rate of Land Use Land Cover change. The findings indicate that the forest landscape has undergone changes, transitioning both into different land cover categories and within various forest classifications within the study area.

OP4. SUSTAINABILITY IN FASHION: A DESIGNER AND BRAND'S PERSPECTIVE

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ABSTRACT

In recent years, the fashion industry has witnessed an increase in consumption attributed to falling clothing prices, resulting in the spread of "cheap chic" apparel worn briefly and discarded. This phenomenon has triggered various ethical and environmental challenges, spotlighting sustainability concerns. To address these issues, numerous fashion designers and brands proactively develop innovative systems and mechanisms tailored to the industry's evolving demands. An integral facet of this paradigm shift is designers growing adoption of sustainable fashion manufacturing practices, solidifying their role within the contemporary fashion environment. A noticeable development from the status quo a decade ago is the industry's increased emphasis on sustainable production. This research paper introduces the Special Issue on "Sustainability in Fashion" and "Sustainable Design Trends in the Fashion Industry," providing a comprehensive synthesis of relevant research in these domains. Moreover, this paper underscores the multifaceted dimensions of sustainable fashion strategies and management that fashion designers and brands embrace. Fundamental use encompasses utilising environmentally friendly raw materials, integrating natural dyes, employing ecologically conscious production techniques, promoting equitable labour practices, and integrating renewable energy resources. The paper is equally zealous in emphasizing the importance of advancing sustainable fashion strategies and management. This encompasses a holistic approach, including adopting eco-friendly raw materials, incorporating natural dyes, implementing sustainable production methodologies, adhering to equitable labour practices, and leveraging the potential of renewable energy sources.

OP5. ASSESSMENT OF GROUNDWATER QUALITY WITH REFERENCE TO ITS POTABILITY IN PARTS OF SIWALIK REGION, NORTHWEST INDIA

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ABSTRACT

Clean and safe drinking water is basic to human endurance as the nature of water is straightforwardly connected to their wellbeing. The current investigation focuses on parts of the Siwalik Region in North-West India, comprising of the Union Territory of Chandigarh and some parts of districts SAS Nagar in Punjab and Panchkula in Haryana. SDG 6 refers to 'Clean Water and Sanitation' and aims to "ensure availability and sustainable management of water and sanitation for all". It has 8 targets and first 3 targets are related to drinking water supply, quality and sanitation and most of them are to be achieved by the year 2030. A total of 91 groundwater samples were gathered during pre-monsoon season (May 2021) from springs, wells, hand pumps, tube wells and bore wells of the study area to assess its appropriateness for potability. Physico-chemical analysis was carried out for thirteen water quality parameters, including pH, EC, TDS, Ca^{2+}, Mg^{2+}, Na^{+}, K^{+}, HCO_3^{-}, NO_3^{-}, F^{-}, Cl^{-}, PO_4^{3-} and SO_4^{2-} and the Bureau of Indian Standards (BIS, 2012) guidelines were utilized to inspect the groundwater quality. Majority of the parameters were found within the prescribed limits of BIS for drinking except nitrate in 17 samples (18.68%) which was above the permissible limits of 45mg/L. Raised levels of nitrate in these water samples can antagonistically affect the individuals specially children and elderly people. Proper planning and management of groundwater resources are necessary to maintain the health of residents in the delicate ecosystem of Siwaliks.

OP6. BIOPLASTIC PRODUCTION FROM FRUIT AND VEGETABLE PROCESSING WASTE FOR BIOACTIVE PACKAGING APPLICATIONS.

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ABSTRACT

Plastic Pollution is a universally recognized risk which has caused the devolution in all aspects to the environment. Biodegradable and active packaging materials are the most promising characteristics for substituting non-biodegradable, petroleum-based plastics and it also leads towards greener and sustainable packaging solutions. There has been active interest in finding the suitable bio-based material for bioplastic production from both economic and ecological point of view. According to Sustainable Development Goals of the 2030 Agenda, there has been increased interest in the production of bio-based plastics from agricultural crop residue

and organic wastes. In this regard, there has been intense research in the use of polysaccharides mainly from food wastes or lignocellulosic materials. The biofilms made out of single polysaccharide has lesser properties suitable for packaging but when these polysaccharides films are blended with proteins, nanomaterials, essential oils, etc., the properties get enhanced and thus are more beneficial and suitable to be used in packaging industries. The reinforcement of plasticizers, with lignocellulosic or starch blends have also shown promising and environmentally viable results.

OP7. A NEW ROCKFALL PROPAGATION MODEL: EXAMINING ROCKFALL RISK IN MANIKARAN, NW HIMALAYA, INDIA

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ABSTRACT

In August 2015, a significant rockfall incident occurred in Manikaran town situated in the Kullu district of Himachal Pradesh, within the NW Himalayan region of India. This event destroyed a six-story Gurudwara building, tragically claiming the lives of approximately 10 individuals, and causing injuries to 15 people who were asleep in the Gurudwara's Sarai accommodations. Through thorough field investigations, it was revealed that the August 2015 rockfall occurrence wasn't solely caused by a solitary rock block impacting the Gurudwara. Rather, the primary source rock block initiated a sequence of rockfall events by mobilizing static boulders that were positioned on the surface along the path of the moving block. To enhance our understanding of this incident and to anticipate potential future rockfall hazards in Manikaran, a novel model for rockfall propagation is developed. The novelty of this model is to integrate the effect of the remobilization of deposited blocks, which was evidenced to be of major influence in the site of Manikaran, using a rigid body approach within the Siconos software framework. This endeavor aims to provide valuable insights into the 2015 Manikaran rockfall disaster and offer predictive capabilities for assessing future rockfall risks in the area. This research aims to develop a comprehensive understanding of rockfall hazard in the Manikaran region. The study is designed to contribute to rockfall risk assessment, specifically focusing on integrating remobilization of static boulders and propagation of pre-fragmented rock mass in the Manikaran rockfall site using detailed field measurements.

OP8. ASSESSMENT, CHARACTERIZATIONS AND PHYSICAL ENRICHMENT OF LITHIUM FROM MAJOR COAL-FIELD OF ASSAM STATE, NE INDIA

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ABSTRACT

Lithium is the lightest of all metals sometime it is referring to as “white gold”. It is a valuable metal that has increased demand for its use in lithium-ion batteries, especially for electric vehicles. Lithium can be produced from various natural resources, e.g., mineral like

spodumene, clays mineral like hectorite, salt lakes, and underground brines. However, the geological factors that affect the lithium content and mineralogy of these resources are not well understood. The aim of this study is to investigate the lithium concentration, mineral identification, deposition environment and enrichment of lithium in clay-bearing minerals by physical separation. The study focuses on the Girujan Clay Formation of Miocene age in the Makum coalfield in Assam state, NE India. The samples were collected from the parting of coal seams (clay) in the Girujan Clay Formation belongs to Tripam Group. The samples were subjected to particle size classification, centrifuge separation, magnetic separation, and electrostatic separation to separate the clays that contain lithium from the other impurities. The results showed a moderate degree of enrichment in the smaller particles. The centrifuge separation found to be an effective way to maximize the lithium enrichment from the non-coal bearing strata (clay). The study demonstrated that physical separation techniques can be used to enrich lithium from clay-bearing formations. The study also provided insights into the geologic factors that influence the lithium content and mineralogy of these formations. The study suggested that clay-bearing formations can be a potential source of lithium for future exploration and development.

OP9. MODE OF OCCURRENCE OF RARE EARTH ELEMENTS IN DIFFERENT GRADES OF INDIAN COAL

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ABSTRACT

Yearly coal and byproduct production holds adequate rare earth elements (REEs) to meet today's demand. The way REEs are found in coal is crucial, shaping their behavior during combustion, beneficiation, conversion, weathering, leaching, and other coal-related chemical processes. This behavior, in turn, impacts the environment, health, technology, and byproduct retrieval. The mode of occurrence in coal also reveals their source. Sequential leaching of Rajasthan (Lignite) and Makum (Sub-bituminous) coal samples provided insights into the distribution and mobility of elements, notably rare earth elements (REEs). Sequential leaching of Rajasthan coalfield coal revealed that REE in water-soluble and ion-exchangeable forms were relatively low (0.05% and 0.50%, respectively), but organic form contained 30% and acid-soluble form up to 80% of REE. The fraction of REE in water-soluble, ion-exchangeable, and acid-soluble forms in makum coalfield samples was quite low, at approximately or less than 1%. REE concentrations in sulphide and silicate forms were less than 12% and 15%, respectively. However, the organic form had a considerable amount of REE, around 73%. REEs are found in coal samples containing both organic and inorganic materials. The varied REE occurrences in lignite and subbituminous coal suggest that the fractional impacts of REEs in various sedimentary environments or of various materials in a single environment vary.

OP10. IMPLICATIONS OF LAND USE ACTIVITIES AND LANDSLIDES ON GEODIVERSITY OF PARBATI RIVER BASIN, NORTH-WESTERN HIMALAYAN REGION, INDIA

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ABSTRACT

Geodiversity, the variety of land features, significantly influences land use in the Himalayan region. This study delves into the intricate relationship between geodiversity and land use in the context of the Himalayan region, focusing on the *Parbati River Basin*. *Geodiversity*, encompassing a variety of geological, geomorphological, hydrological, and pedological elements, plays a pivotal role in shaping the landscape and influencing land use patterns. Our research employed a quantitative grid-based approach, for mapping geodiversity indices associated with the basin's geodiversity components. Our findings reveal a diverse geodiversity landscape, with particularly high concentrations found in the western part of the basin and along major stream channels. However, a critical concern emerges from geohazards such as landslides and cloud bursts within the basin. Key economic drivers in the region, such as horticulture and tourism, along with the development of hydropower projects, have significantly altered the land use and land cover patterns over the years. These transformations pose a potential threat to the geodiversity elements of the Parbati basin, which hold immense potential for ecosystem services and activities including geo-tourism, scientific research, educational pursuits, and recreational opportunities. To strike a balance between developmental needs and environmental preservation, it is imperative to proactively manage and conserve the geodiversity of the Parbati basin. Our study underscores the importance of responsible and sustainable land use planning to ensure the harmonious coexistence of nature and development in this ecologically sensitive region.

OP11. MAPPING THE TRADITIONAL CULTURAL LANDSCAPE. AN INITIATIVE TOWARDS HERITAGE CONSERVATION AND CULTURAL SUSTAINABILITY

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ABSTRACT

Landscape in general can be categorized into natural and cultural. The natural landscape includes every aspect of the nature that is untouched by man and the cultural landscape refers to the landscape that is an outcome of the acts of man and his expression on the former. The vernacular or traditional landscape is one of the categories of cultural landscapes one which organically evolved landscape and an outcome of the social and cultural attitude of a community reflecting the physical and cognitive manifestations of the cultural characteristic of their everyday lives. The traditional landscape attributes should be mapped and seen in comparison with the natural mapped landscapes of an indigenous region for analysis and to draw out inferences that may help and assist in understanding the local culture better and how the region should be approached in terms of future development strategies by policy makers

and government institutions. Objectives: 1) How GIS mapping tools can help locate conceived spaces of vernacular cultural attributes and help in visualizing the intangible cultural characteristics through correlation of natural and cultural attributes. Methodology: A case study of 'Shumso region' has been taken which is a delineated cultural region in Kinnaur District of Himachal Pradesh.

OP12. THE IMPACT OF ACTIVE TECTONICS ON EARTHQUAKES AND LANDSLIDES IN NORTH INDIA: A REVIEW OF RECENT RESEARCH

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ABSTRACT

Active tectonics is the sub-discipline of tectonics that deals with the tectonogeomorphic deformations since ~150-100ka. These deformations often manifest in the form of earthquake and landslide. The Himalayan fold-thrust belt and adjoining foreland basin constitute the tectonically active regions of north India. Complex geotectonic system and numerous active faults have led to some of the most serious disasters in the region. This has been the primary basis for decades of geohazard and active tectonics research focused in the north India. It has been found that the Himalayan earthquakes are mostly associated with the release of accumulated strain by slip on the Main Himalayan Thrust plate boundary fault, as a consequence of convergence of the Indian Plate towards Eurasia. While landslides could be triggered by both the climatic and tectonic factors, the majority of events have been found to be associated with high precipitation and vulnerable geological and structural elements. The recent advances in Geographical Information System (GIS), GPS data, availability of high-resolution open access space observation data, and modelling techniques have greatly improved the fast and effective surveying of active faults, and provided a way for more comprehensive assimilation of a wide array of parameters to forecast, circumvent, and mitigate the geohazards. Despite the advances in the scientific methods, accuracy and reliability of the hazard assessment, there is still a need for closer collaboration between the academic research and enforcing agencies of the country to bring the outputs in the benefit of society.

OP13. ASSESSMENT OF AIR POLLUTION TOLERANCE AND PERFORMANCE OF SOME PLANT SPECIES GROWING IN PUBLIC PARKS.

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ABSTRACT

Urban greening is an important component of air pollution mitigation strategies for cities. Plants combat air pollution by deposition of particulate matter and absorption of harmful gases (NOx, O3 and SOx). Different plant species vary in their tolerance to air pollution. Some plant

species are sensitive and can act as bioindicators of air pollution while some are tolerant and act as a sink for air pollutants. Hence, selection of different species before planting in a particular region becomes important. Air Pollution Tolerance Index (APTI) and Anticipated Performance Index (API) are two indices that have been used widely to select plant species that are tolerant and better at mitigating air pollution respectively. Considering this, present study was planned to evaluate the tolerance and performance of four tree species viz. *Ficus religiosa*, *Morus alba*, *Polyalthia longifolia* and *Syzygium cumini* growing in five public parks of Amritsar city, Punjab. APTI was determined by analyzing pH, contents of total chlorophyll, relative water and ascorbic acid in selected plant species. API was determined using APTI scores, and morphological and socio-economic characteristics of plants. APTI analysis showed that all selected tree species were moderately tolerant to air pollution. According to API analysis, three species viz. *Ficus religiosa*, *Polyalthia longifolia* and *Syzygium cumini* were best suited for plantation in these public parks and should be given preference during plantation drives to minimize deleterious consequences of air pollution in this region.

OP14. GEOCHEMICAL AND PETROLOGICAL STUDY OF META SEDIMENTARY AND META IGNEOUS ROCKS OF NASIBPUR AND SURRROUNDING AREAS, NORTH DELHI FOLD BELT, NW INDIA: INSIGHTS INTO FLUID-ROCK EXCHANGE PROCESSES

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ABSTRACT

The paper represents the geochemical and petrological study of metasedimentary and meta igneous rocks from Nasibpur and surrounding area comprises several isolated and linear hills such as Raghunathpura, Kirarod ki Dhani, Azamnagar, Dhani Faizabad and Mandlana which forms the part of North Delhi Fold belt. The lithological units consist of Ajabgarh group of Delhi supergroup which contain amphibole bearing quartzite, ferruginous quartzite, quarzitic phyllites, garnet mica schist, granitic gneiss, calc-silicate rock and granite associated with pegmatites. Geochemically granites show SiO2 (60.10-73.15%), high alkali contents Na2O + K2O (7.98-12.26 wt%). High MgO, CaO in quartzites indicates the role of melt induced metasomatism in the rocks. The trace element compositions and mobility such as elevated concentration of Ba, Sr, Pb used as a good signature of fluid vs. melt induced metasomatism which is further complicated by partial melting and fractional crystallization processes. High Al contents in pegmatites and rare alkalis (Rb, Cs) suggest the LCT fractionation trend affiliation. Based on petrographical evidence albitization in the rocks are marked by different metasomatic zones. Scapolitization and sericitization linked with transformation of feldspars highlights fluid-mediated replacement. Therefore, in view of the above signatures large scale fluid flow in the area is significant and the geochemical composition help us to understand the origin of the fluid and various magmatic and metasomatic overprints.

OP15. A COMPREHENSIVE EXAMINATION OF WATER QUALITY DETERIORATION AND HEAVY METAL CONTAMINATION IN BUDDHA NALA, PUNJAB

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ABSTRACT

The water quality of Buddha Nala, a significant freshwater source in Ludhiana, Punjab, has alarmingly declined, primarily due to the influx of industrial effluents and untreated domestic sewage. The importance of assessing the effects of industrial water mixing on Buddha Nala's appropriateness for consumption and the environment is emphasized by this study. To evaluate physical water quality characteristics, we methodically collected surface water samples from three places along Buddha Nala, encompassing upstream and downstream points. Sample 1 shows a pH level of 8.0, while Sample 2 and Sample 3 register pH levels of 7.3 and 7.1, respectively. This consistent pH decrease, coupled with a noticeable shift in color from transparent to black and an alteration in odor, is observed downstream along the Sutlej River. Furthermore, drainage soils adjacent to Buddha Nala were found contaminated with heavy metals, including cadmium, chromium, cobalt, copper, lead, nickel, and zinc, surpassing permissible limits. These elevated heavy metal concentrations pose a potential threat to vegetation in the vicinity. To mitigate contamination, it is imperative to not only implement advanced wastewater treatment but also enact stringent regulations to curb industrial waste discharge and safeguard agricultural practices in the region.

OP16. THE GREAT HIMALAYAN EARTHQUAKE

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ABSTRACT

Indian plate continues to move in northeast direction at roughly 5cm/yr, pushing Himalayas higher as the Indian plate underthrust the Eurasian plate, the movement release the stored up elastic strain, But stress built are only released at only 2cm/yr resulting in stress release gap and elastic energy storage of 3cm/yr.It is this interaction which causes frequent earthquake in Himalayan and adjoining region. Detailed survey indicate that significant earthquake occurred in past twelve decades, some of them are: 1897 Assam 8.7 1905 Kangra Valley 8.6 1918 Assam 7.6 1934 Bihar-Nepal 8.4 1947 Assam 7.9 1950 Assam 8.7 however no severe earthquake occurred in the uttarakhand region since long thereby indicating a seismic gap, this also indicates that a major seismic disaster perhaps is due. The Gorkha earthquake has been studied to predict this great Himalayan earthquake. Therefore, such studies are required from local to regional level to take precautionary measures.

OP17. LANDSLIDES IN HIMALAYAN MOUNTAINS OF HIMACHAL PRADESH

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ABSTRACT

Landslide encompasses all varieties of mass movements consisting of different types of rock fall, topple and debris flow. The failure of shear strength or exceeding shear stress leads to down slope movement of surface material. These are short lived and suddenly occurring phenomena that cause considerable loss of life, widespread damages to infrastructure and facilities. The state of Himachal Pradesh is inherently prone to disasters, more so as it is a part of the Himalayan Mountain system. Frequent natural disasters of varying intensity hamper the development of the state and strain the state exchequer. The natural conditions including unstable steep slopes, weak rock structure and intense rainfall are main reasons for slope failure in the area. As per Government of India (2003), nearly 97.42 per cent of the total geographical area of the state is prone to landslide hazard. Over 14 per cent and 70 per cent area is liable to severe to very high and high risk of landslides. In severe landslide hazard risk category Kullu district (33.70%) with one-third area under this class tops the list followed by Chamba (33.28%), Solan (29.11%), Mandi (25.01%), Bilaspur (18.91%), Shimla (17.79%) and Kinnaur (13.73%). The annual distribution of landslide events for the period 1971-2009 displays the steadily rising trend in landslide frequency and 919 landslide events were recorded in Himachal Pradesh. The vulnerability in these geologically young and unstable steep slopes has increased due to anthropogenic activity such as road construction, expansion of settlements and changes in agriculture pattern.

OP18. ROCKFALL MODELING APPROACHES: STATE-OF-THE-ART REVIEW

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ABSTRACT

Rockfall is a geological phenomenon characterized by the detachment, descent, rolling, and bouncing of rock fragments. The potentially unstable rock mass separates from its parent rock, and under the influence of gravity, it descends from steep or sub-vertical slopes, causing rockfall disasters. To better understand and mitigate the risks associated with rockfalls, various modeling approaches have been developed. These models provide valuable insights into the kinematic characteristics of the blocks, such as their velocity, jump height, kinetic energy, and spatial distribution, which serve several essential purposes, including risk assessment, hazard zoning, design considerations, verification, and the proposal of technical mitigation measures. To address the complexities of rockfall dynamics, we use 2-D models, 2.5-D models (referred to as quasi-3-D models), and 3-D models. Furthermore, these models can be classified as lumped mass models and rigid body models. In lumped mass models, the rock block is simplified as a point mass, whereas rigid body models consider the rockfall as a rigid unit, providing a more accurate representation of the actual behavior of rock during a fall. This

study will provide a concise overview of the modeling approaches that have been developed over the past three decades to study rockfall dynamics. The 3-D rigid body modeling approach represents state-of-the-art methods in rockfall modeling. Through the examination of relevant case studies from the Himalayas, this study explores the capabilities and advantages of these approaches in simulating and understanding the complex behavior of rockfalls.

OP19. MITIGATING HIMALAYAN LANDSLIDE CRISIS: SAVING LIVES AND INFRASTRUCTURE THROUGH GEOLOGICAL EXPERTISE AMIDST CLIMATE CHANGE

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ABSTRACT

Landslides in the Himalayas have emerged as a pressing concern in recent years, with climate change exacerbating their frequency and intensity. This study presents a succinct overview of the complex relationship between climate change and landslides in the Himalayan region, highlighting the need for proactive mitigation strategies. The Himalayan region is known for its unique topography, characterized by steep slopes and fragile geological formations. Climate change-induced alterations in temperature and precipitation patterns have triggered a series of environmental changes, including glacier retreat, increased snowmelt, and altered rainfall patterns. These changes have a profound impact on the stability of the region's slopes, rendering them more susceptible to landslides. Moreover, altered precipitation patterns can result in prolonged wet seasons, further exacerbating soil saturation. Consequently, even minor triggers, such as earthquakes or heavy rainfall, can induce catastrophic landslides. Construction is done without considering the geology of the region which leads to loss of life, property, and agricultural land. To mitigate these risks, comprehensive measures are required, including early warning systems, reforestation, sustainable land use planning, and infrastructure development designed to withstand landslides which require geological consultation. This study underscores the urgency of addressing the climate change-induced landslide crisis in the Himalayas and the role of a geologist in overcoming these problems. Only through proactive measures and awareness among people can reduce the impact of landslides on the region's inhabitants and protect its infrastructure.

OP20. GROUNDWATER QUALITY ANALYSIS IN SAFIDON AND JULANA BLOCK OF JIND

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ABSTRACT

The quality of groundwater can affect not only health, but also society and the economy. Therefore, groundwater quality evaluation is essential. The Jind district of Haryana, India is densely populated with agriculture. Therefore, researchers conducted groundwater studies in Safidon and Julana block of Jind based on extensive groundwater samples analysis it has been

documented that groundwater need pretreatment to make it fit for drinking purposes, in particular for Julana block. Further, what needs attention is the hardness of groundwater in both Julana and Safidon blocks, which makes it unfit for human consumption. Therefore, the cause for this hardness needs further studies so that proper remedies can be suggested.

OP21. NEED FOR MITIGATION STRATEGIES FOR CHANGING CLIMATE IN INDIA

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ABSTRACT

Climate change is more rapid and pronounced than expected. According to UN, climate change refers to long term shifts in temperature and weather patterns. Such shifts can be natural or can be caused by human activities. This has already caused 1 degree Celsius of global warming above pre-industrial level. It is likely to reach 1.5 degree Celsius between 2030 and 2052 if current emission rates persist. Atmospheric CO2 has been measured since 1957 at the Mauna Loa observatory in Hawaii, operated by National Oceanic and Atmospheric administration. By summer 2021, the amount of CO2 in the atmosphere had increased by 50% compared to before the Industrial Revolution. India is the fourth largest CO2 emitter in the world after China, USA, and European Union. It experiences more frequent and severe heatwaves, changing rainfall patterns, rising sea level. Changes can have bad effect on agriculture, water resources and infrastructure. Climate change is pressing global challenge and the need to mitigate its impact is more urgent than ever. Countries like Canada, Sweden implemented carbon tax in 1995 which has led to significant reduction in carbon emission. In 2015, Paris agreement was introduced with main objectives of limiting global temperature. WHY CAN'T WE? India is developing country and highly populated so It's our duty take action on climate change and ensure a better quality of life and sustainable opportunities for youth.

OP22. DIESEL EXHAUSTS, SOLID WASTE BURNING AND ENVIRONMENTAL DIOXIN INCREASE: HIGH LUNG CANCER THREATS IN THE STATE OF HARYANA & PUNJAB

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ABSTRACT

Strong evidences have emerged that Dioxins emitted from various industrial processes and diesel combustion are proven human carcinogen, as per US-EPA and ICRA. A case study of Dioxin released from auto-rickshaws, crude diesel generators, municipal waste burning and industrial combustion was done in districts of Haryana and Punjab states in India. There is a regular incomplete combustion of 69,131,000 liters of diesel, annually, by auto-rickshaws and unapproved crude diesel generators used by the public and 15,330 MT of solid waste burning every month, releasing total Dioxins emission more than 370 MT in the environment. Dioxins

are such dangerous carcinogen that 0.1ug / L of air causes 10 cancer cases. What is more important that while smoke released by industries is released above 30 feet but the smoke containing Dioxin released by auto-rickshaws, unapproved diesel generators and municipal waste burning in open remains at lowest strata up to 10 feet where human population breaths more, thus inhaling even higher doses of Dioxin per day. Out of approximately 400 cancer cases in the Haryana state, 209 cases are estimated and suspected to be due to Dioxins alone! This model of Dioxin related carcinogenesis should be well extended to other cities of the states of Haryana and Punjab. The policy makers and pollution law enforcing agencies need to swing into action for absolute curb on emission of dreaded Dioxins in the environment as Dioxin does discriminate between the rich or poor; powerful or weak; VIP or common man.

ABSTRACTS OF POSTER PRESENTATIONS

PARTICIPANTS

S. No.	Name of participant	Affiliating institution	Title of abstract
1.	Seema Singh	Department of Geology, Panjab University, Chandigarh-160014	Palaeosol carbonates as proxy tools in earth sciences: Global status and limitations
2.	Akanksha Garg	UIFT, Panjab University, Chandigarh	A strategy: An NGO Choti Si Asha empowering rural women in India
3.	Anshul Dhiman	Department of Geology, Panjab University, Chandigarh	Global scientific perspectives on deccan bole bed micromorphology in India
4.	Arshdeep Kaur Sahi	Department of Environmental Studies, Panjab University, Chandigarh	Investigation of Yersinia pestis and its relationship to the cell cycle
5.	Chahat	Department of Environment Studies, Panjab University, Chandigarh, 160014, India	Cleaner waters: Photocatalytic dye breakdown in industrial effluent
6.	Ishani Sharma	Department of Geology, Panjab University, Chandigarh	Evaluation of groundwater quality for drinking and agricultural purposes in Malwa region, southwest of Punjab, India
7.	Shreya Gupta	Department of Geology, Panjab University, Chandigarh	Implications of industrial water mixing in the Buddha Nala: A case study on water quality and environmental impact

PP1. PALAEOSOL CARBONATES AS PROXY TOOLS IN EARTH SCIENCES: GLOBAL STATUS AND LIMITATIONS

Seema Singh[1]

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ABSTRACT

Since last few decades, palaeosol carbonate studies are widely used worldwide as one of the best proxy tools for multiple earth sciences applications e.g., palaeoclimate, palaeoenvironment, palaeoecology and palaeoaltimetry reconstructions. In particular, the stable C and O isotope analyses of palaeosol carbonates has increased manifold due to its most promising information on palaeoclimate conditions. It has been found from extensive literature survey that though such studies have increased drastically but no standard procedure is followed in establishing the pedogenic nature of carbonates used for stable isotope analyses. It indeed has resulted in a research tradition of its own. This approach of carrying out stable isotope analyses on palaeosol carbonates has serious scientific concerns and need immediate attention of the earth scientists because such data generated and published without establishing pedogenic nature is unreliable to use for wide array of applications. A compilation of data-set from carbonates in various Cenozoic palaeosol profiles whose pedogenic nature has been well established prior to do stable isotope analyses, have been found to show the reliability compared to palaeosol carbonates wherein pedogenic nature has not been established. Thus, the palaeosol carbonates can be considered as robust proxy tools only if their pedogenic nature is established based on multiple criteria ranging from morphological, micromorphological and geochemical signatures.

PP2. A STRATEGY: AN NGO CHOTI SI ASHA EMPOWERING RURAL WOMEN IN INDIA

Akanksha Garg[1], Prabhdip Brar[1]

[1]*University Institute of Fashion Technology and Vocational Development, Panjab University, Chandigarh*

ABSTRACT

This research paper focuses on the success story and best practices of NGO Choti si Asha in empowering rural women through skill-building and income-generation programs. The study employs a multi-stage research methodology to gather qualitative and provide comprehensive insights. The paper documents the positive impact of Choti si Asha on the lives of rural women and assesses the efficacy of the products created by these women within the organization. Additionally, the paper developed unique products inspired by the techniques employed by Choti si Asha. Through a comprehensive analysis of the organization's initiatives, success stories, and process assessments, this research paper highlights the transformative power of Choti si Asha's interventions in uplifting rural women, fostering economic independence, and promoting sustainable development. The findings of this research contribute to the existing literature on women's empowerment and offer valuable insights for NGOs, policymakers, and stakeholders interested in replicating and scaling successful models of empowerment in rural communities.

PP3. GLOBAL SCIENTIFIC PERSPECTIVES ON DECCAN BOLE BED MICROMORPHOLOGY IN INDIA

Anshul Dhiman[1], Seema Singh[1]
[1]*Department of Geology, Panjab University, Chandigarh*

ABSTRACT

The Earth's geologic history witnessed widespread flood-basalt volcanic eruptions within restricted time periods and therein the Indian Deccan traps form one of the world's largest such volcanic province. These globally occurring flood basalt volcanic eruptions consist of intravolcanic layers/strata/units which are commonly referred as 'bole beds'. The bole beds have great potential in reconstruction of environment and climate conditions during their formation because these represent short to prolonged hiatus in volcanic activity and landscape stability, resulting in subsequent direct interaction with Earth's atmosphere, biosphere and hydrosphere. Extensive literature survey shows that significant attention on Deccan volcanic bole beds studies using varied geochemical proxies has been done recently but researchers reached no consensus on their nature and origin. This could be attributed to lack of their detailed, systematic micromorphological studies. Whereas, detailed morphological and micromorphological studies are common and widely applied in bole beds of flood basalt flows in different parts of the world. Thus, this becomes the major gap in knowledge in the Indian part of volcanic occurrences, including the extensive Deccan volcanic bole beds. Amongst most urgent issues for future research is the need for such investigations during different phases of Deccan volcanism, thereby resulting in greater clarity on the environment and climate during greenhouse phase of Earth. Further, it will prove significant for making comparisons with similar studies done in global, contemporaneous volcanic bole beds resulting in more possibilities for a better understanding of Earth's geological evolution and its biosphere in the present and the future.

PP4. INVESTIGATION OF YERSINIA PESTIS AND ITS RELATIONSHIP TO THE CELL CYCLE

Arshdeep Kaur Sahi[1], Bunty Sharma[2], Rajeev Kumar[1]
[1]*Department of Environmental Studies, Panjab University, Chandigarh,* [2]*Research and Development, Molekule Inc., Florida, USA*

ABSTRACT

The Bubonic Plague also known as the Black Death was a pandemic caused by a zoonotic bacteria named *Yersinia Pestis* that wiped out 50% of the European population from 1346 to 1353. In the unsanitary conditions of Europe at the time, this bacterium was primarily transmitted through vectors such as fleas that infest rodents like rats. Many symptoms characterize the plague including chills, fever, and the development of painful swollen lymph nodes called buboes. Though Y. Pestis multiplies through binary fission, the cell cycle is still prevalent in the immune response of the immune cells that fight the disease. Because Y. Pestis doesn't reproduce using mitosis, there is little research that has been conducted on the relationship between the cell cycle and the *Black Plague*. Cells that use mitosis to divide

generally follow the same cycle, thus, an onion root tip was used to observe the process of mitosis and the results were compared to the mitosis in lymphocytes. In this study, the relationship between mitosis and epidemiology was studied through the examination of cells in different phases of mitosis on an onion root tip and comparing these observations to an epidemics model with the parameters of the *Black Plague*.

PP5. CLEANER WATERS: PHOTOCATALYTIC DYE BREAKDOWN IN INDUSTRIAL EFFLUENT

Chahat[1], Bunty Sharma[2], Rajeev Kumar[1], Ganga Ram Chaudhary[2]

[1] Department of Environment Studies, Panjab University, Chandigarh, [2]CIL/SAIF/UCIM, Panjab University, Chandigarh

ABSTRACT

Dye plays a significant role in plenty of industries, primarily, textile and paper industries. These dyes are either non-biodegradable or take decades to degrade thus slowly depositing and contaminating the rivers and wastewater. Dyes present in the effluent cause environmental pollution which eventually affects the entire ecosystem. This work discusses the degradation of dyes using the principle of photocatalysis. A photocatalyst can be defined as a substance that uses light to alter the rate of reaction. Photocatalysis refers to a chemical process, wherein a photocatalyst accelerates the ongoing reaction by absorbing photons. Photocatalyst is generally made of metal oxides and their composites which are exposed to UV or visible light. The energy absorbed must be equal to or greater than the band gap energy of the photocatalyst used. Once on the surface, electrons in the conduction band give out the negative charge to the molecules to be absorbed on the photocatalyst, reducing the molecule, whereas, holes on the valence band accept the electrons from the molecules nearby thereby giving out an oxidative reaction. The products formed after this interaction give out highly oxidative compounds like hydroxyl group or hydrogen peroxide which react with the contaminants hence degrading them. However, photocatalysis has several cons in regards to dye degradation in wastewater, some of which include, stability of photocatalyst, lower rate of reaction and inactivation in the dark. However, researchers have been working on addressing these drawbacks to come up with more sustainable and practical ways for the betterment of the experiment.

PP6. EVALUATION OF GROUNDWATER QUALITY FOR DRINKING AND AGRICULTURAL PURPOSES IN MALWA REGION, SOUTHWEST OF PUNJAB, INDIA

Ishani Sharma[1]

[1]Department of Geology, Panjab University, Chandiagarh

ABSTRACT

Groundwater development is highly essential in order to make a region socio-economically sustainable. The quality of groundwater is a major concern as it is continuously degrading due to natural and anthropogenic sources. The Malwa region of Punjab, India, is facing an unprecedented crisis of environmental health linked to indiscriminate, excessive, and unsafe use of pesticides, fertilizers and poor groundwater quality. The region has been described as

India's "cancer capital" due to abnormally high number of cancer cases. Studies of this region have also highlighted a sharp increase in many other pesticide related diseases, such as mental retardation and reproductive disorders. The hydrochemical analysis of the study area in parts of Malwa region, Punjab (India) reveals that groundwater is highly contaminated except for few locations. A study of 2018 which was commissioned by Centre's Department of Science and Technology, had found concentration of calcium, magnesium, sodium, nitrate and fluorine higher than the Permissible limits, rendering 80.3% groundwater of Malwa unsuitable for drinking. Some of the areas have more content of uranium, and some have high content of fluoride or other heavy metals in groundwater. These metals in the groundwater are affecting the health of the people. The parameters such as magnesium ratio and corrosivity ratios values showed that water is not suitable for agriculture and domestic use.

PP7. IMPLICATIONS OF INDUSTRIAL WATER MIXING IN THE BUDDHA NALA: A CASE STUDY ON WATER QUALITY AND ENVIRONMENTAL IMPACT

Shreya Gupta[1], Aakansha Sharma[1]

[1]*Department of Geology, Panjab University, Chandigarh*

ABSTRACT

The Buddha Nala, once a vital freshwater resource in Ludhiana, Punjab, has witnessed a concerning deterioration in water quality, primarily attributed to industrial effluents and domestic sewage contamination. This study aims to underscore the critical importance of assessing industrial water mixing in the field area and its implications on the Buddha Nala's suitability for consumption and its environmental impact. *Surface water* samples were systematically collected from three locations along the Buddha Nala, encompassing both upstream and downstream points for physical water quality parameters. Historically suitable for consumption, the water now exhibits decreasing pH levels and escalating contamination, primarily attributed to industrial effluents and untreated domestic sewage. Sample 1 exhibits a pH level of 8.0, whereas Sample 2 and Sample 3 register pH levels of 7.3 and 7.1, respectively. This gradual pH decrease is consistently observed along the course of the Sutlej River throughout most of Ludhiana until the north-western corner of the district. The presence of acidic contaminants, stemming from industrial activities, has transformed the character of the water in two significant ways. Firstly, it contributes to the pollution of the Sutlej River, subsequently impacting the entire state's water resources and agriculture. Secondly, it creates a direct health hazard for the local population. The study underscores the pressing need for systematic assessments and conservation measures for the Buddha Nala, emphasizing the detrimental consequences of unchecked industrial water mixing and untreated sewage discharge. Urgent action, including sewage treatment facilities, is imperative to restore the Nala's ecological balance and safeguard public health.

Engineering and Management Sciences

- Engineering & Technology (UIET)
- Chemical Engineering and Technology (UICET)
- Sophisticated Analytical Instrumentation Facility (SAIF)
- University Institute of Applied Management Sciences (UIAMS)
- University Business School (UBS)
- University Institute of Hotel & Tourism Management, (UIHTM)
- Fashion Technology and Vocational Development (UIFT)

CO-ORDINATORS

Prof. Vishal Gupta

Dr. Anupreet Kaur

CHASCON – 2023
National Conference on
Global Science for Global Wellbeing

SECTIONAL PROGRAMME (OCTOBER 13, 2023)
ENGINEERING AND MANAGEMENT SCIENCES
Venue: Academic Block-I, UIET, Panjab University, Chandigarh

Sectional President Professor Vishal Gupta 9914504524	**Sectional Secretary** Dr. Anupreet Kaur 8283932410
Time	**Program**
9:00 – 9:45	Display of Posters – UG/PG and Research Scholars **Venue:** Seminar Hall, Room No. 114 (Old Library, UIET), Academic Block-1, UIET, Sector-25, PU Chandigarh
9:45 – 10:00	Commencement of Program **Venue:** Seminar Hall, Room No. 114 (Old Library, UIET), Academic Block-1, UIET, Sector-25, PU Chandigarh
10:00 – 10:45	**Session Chair:** Professor Veenu Mangat **Speaker:** Dr. Prabhjot Malhi Former Professor and Unit In charge (Child Psychology) Department of Paediatrics, Post Graduate Institute of Medical Education and Research, Consultant (Child Psychology) Department of Mental Health and Behavioural Sciences, Fortis Med Centre, Sector 11, Chandigarh ***"Promoting Resilience among the Youth"***
10:45 – 11:30	**Session Chair:** Professor Mukesh Kumar **Speaker:** Dr. Poonam Saini Associate Professor in Computer Science and Engineering, PEC University of Technology, Chandigarh ***"Evolution of Artificial Intelligence and Data Science in Engineering"***
11:30 – 12:00	Tea break
12:00 – 13:00	Oral Presentations (Faculty) **Venue:** Seminar Hall, Room No. 114 (Old Library, UIET), Academic Block-1, UIET, Sector-25, PU Chandigarh Poster Presentations (UG/PG) **Venue:** Seminar Hall, Room No. 114 (Old Library, UIET), Academic Block-1, UIET, Sector-25, PU Chandigarh
13:00 – 14:00	Lunch
14:00 – 15.30	Oral presentations (Research Scholars) **Venues:** 1. Seminar Hall, Room No. 114 (Old Library, UIET), Academic Block-1, UIET, Sector-25, PU Chandigarh 2. Lecture Hall No. 220, First Floor, Academic Block-I UIET Poster Presentations (Research Scholars) **Venue:** Seminar Hall, Room No. 114 (Old Library, UIET), Academic Block-1, UIET, Sector-25, PU Chandigarh
15:30 – 16:00	Tea break
16:00 onwards	Oral presentations (Research Scholars) **Venues:** 1. Seminar Hall, Room No. 114 (Old Library, UIET), Academic Block-1, UIET, Sector-25, PU Chandigarh 2. Lecture Hall No.220, First Floor, Academic Block-I UIET Poster Presentations (Research Scholars) **Venue:** Seminar Hall, Room No. 114 (Old Library, UIET), Academic Block-1, UIET, Sector-25, PU Chandigarh

ABSTRACTS OF ORAL PRESENTATIONS

PARTICIPANTS

S. No.	Name of participant	Affiliating institution	Title of abstract
1.	Daljeet Kaur	UIET, Panjab University Chandigarh	Development and dielectric studies of zinc oxide based polymer nanocomposite for energy storage applications
2.	Devendra Kumar Singh	Panjab University Regional Centre Sri Muktsar Sahib	Global science for global wellbeing in a divided world
3.	Twinkle Bedi	Dr. SSBUICET, Panjab University, Chandigarh	Prediction of Sales of Apparel using Intelligent Technologies- A Proposed Methodology
4.	Anju Krishna	ECE Department, UIET, Panjab University Chandigarh	IRIS segmentation using deep learning methods
5.	Anju Kumari	UIET, Panjab University, Chandigarh	White box verification of decoder block of a high speed processor using UVM
6.	Ashita Manchanda	UIET, PU, Chandigarh	Minutiae-based automatic fingerprint recognition using CNN
7.	Pravjot Kaur Panesar	Dr.S.S.Bhatnagar University Institute of Chemical Engineering and Technology Chandigarh	Study of different methods for production of alternate fuels using used refined oil
8.	Ruhani Raj	Department of Biotechnology, University Institute of Engineering & Technology, Panjab University, Chandigarh	Computational modeling of dihydropyridine analogs and their binding affinity with target proteins
9.	Sandeep Kour	Department of Electronics and Communication Engineering, UIET, Panjab University, Chandigarh 160014, India	Metallic grating coupler for quantum well infrared photodetector
10.	Seeha Khera	UIET, Panjab University, Chandigarh	Forecasting poverty resulting from the effects of climate change using machine learning

11.	Shivani Verma	UIET, Panjab University, Chandigarh	Optimization of spectrum utilisation parameters in cognitive radio using genetic algorithm
12.	Aanchal Sharma	Department of Computer Science and Applications, Panjab University, Chandigarh	Feature extraction using spectral analysis and discrete wavelet analysis for the classification of cognition in Parkinson's disease
13.	Aashish Tuli	UIET Panjab University, Chandigarh	Piezometric response (curve) fit of nano-reinforced ethylene propylene diene monomer/butyl rubber hybrid nano-composites using an optimized empirical model
14.	Amanpreet Kaur	UIET, Panjab University, Chandigarh	Enhancing wireless network security through AI and ML techniques
15.	Bharti Sharma Lornie	University Institute of Fashion Technology and Vocational Development, PU, Chandigarh	Mapping interdisciplinary approaches in contemporary design practices for sustainable outcomes
16.	Diksha Sharma	University Business School, Panjab University, Chandigarh	Innovative minds, resilient companies, stronger communities: The societal significance of intellectual capital, governance and family on business performance
17.	Harmanjeet Singh Brar	UIET, Panjab University, Chandigarh	Image dehazing algorithm using fusion and contrast adjustment
18.	Isha Bhargav	UIET, Panjab University, Chandigarh	Optimizing computational offloading using mobile edge computing
19.	Junaid Maqbool	UIET, Panjab University, Chandigarh	ExpoSeg- An all-in-one network for exposed tissue segmentation

20.	Kulbir Kaur	University Institute of Fashion Technology & Voctaional Development, Panjab University, Chandigarh	Industry initiatives to slow down the ongoing race in fashion lane
21.	Lovepreet Singh Brar	UIET(ECE), Panjab University, Chandigarh	Image compression of medical images using a series of lossy and lossless encoders
22.	Mehak Singla	Department of ECE, UIET, Panjab University, Chandigarh, India	A brief review of doping methods in nanoscale novel MOS architectures
23.	Nikita	University Business School, Panjab University, Chandigarh	Lending verisimilitude to the retailing by using augmented reality and virtual reality: A bibliometric analysis
24.	Preetjot Kaur	UIET, Panjab University Chandigarh, 160014, India	Enhancing next-gen network base stations through efficiency optimization
25.	Priyana Garg	Dr. S.S.B. University Institute of Chemical Engineering and Technology, Panjab University, Chandigarh, India	Recent advancements in pseudocereal based gluten free bread development and its impact on nutritional status
26.	Sakshi Gupta	Dr. S.S.B UICET, Panjab University, Chandigarh, India	Dairy based protein as a promising biopolymeric vehicle for loading of nutraceuticals
27.	Sarabjit Singh	UIET, Panjab University Chandigarh	Finite element static structural analysis of aluminium nitride and steel 1008 exhaust valve materials for IC engines
28.	Sarita Gautam	Panjab University, Chandigarh	An indian roads dataset for supported and suspended traffic lights detection
29.	Sudarshan Sahu	Department of Biotechnology Engineering, University Institute of Engineering and Technology, Panjab University, Chandigarh	Comparative study for predicting dye removal by algae-bacteria

30.	Tanvir Singh Mann	UIET, Panjab University, Chandigarh	Siaform - A siamese transformer for offline signature verification
31.	Uma Sharma	Department of Computer Science, Panjab University, Chandigarh, India	Melanoma lesion segmentation with attention-augmented U-Net
32.	Neha Bhardwaj	INST, Mohali	Fluorescent nanosensors for detection of food toxins
33.	Sushant Sharma	University School of Chemical Technology, Guru Gobind Singh Indraprastha University, Dwarka 16C, New Delhi 110078, India	Removal of crystal violet dye using electrocoagulation process

OP1. DEVELOPMENT AND DIELECTRIC STUDIES OF ZINC OXIDE BASED POLYMER NANOCOMPOSITE FOR ENERGY STORAGE APPLICATIONS

Daljeet Kaur[1], Charu Madhu[1]

[1]*UIET, Panjab University Chandigarh*

ABSTRACT

Today the demand for the efficient energy storage devices is increased due to surge in the electrical and electronic gadgets in recent years. Polymer nanocomposites are considered to the best solution to meet the requirement of high dielectric constant along with high breakdown strength to achieve high energy density of a material. In this work, safe and environment friendly polymer nanocomposite is developed by using different concentrations (10% to 40 %) of ZnO as nanofiller into the PVDF polymer matrix to study their dielectric behavior. Dielectric studies displayed that value of real portion of dielectric permittivity of virgin PVDF and PVDF-ZnO thin films decreased with increasing applied frequency but the value of dielectric constant increased with increasing ZnO NPs in the PVDF framework. The value of dielectric constant improved by 138% and the dielectric loss decreased by 44% for 40% ZnO in PVDF at 1KHz. The space charge polarization could be the possible cause of enhancement of high dielectric constant in PVDF-ZnO composite films as compared to pure PVDF. The energy density (U_D), which is measure of electrostatic energy storage capacity of the polymeric ceramic improved by 73% with increasing content of ZnO NPs.

OP2. GLOBAL SCIENCE FOR GLOBAL WELLBEING IN A DIVIDED WORLD

Devendra Kumar Singh[1]

[1]*Panjab University Regional Centre Sri Muktsar Sahib*

ABSTRACT

GLOBAL SCIENCE FOR GLOBAL WELL BEING IN A DIVIDED WORLD Devendra Kumar Singh, Panjab University Regional Centre Muktsar, from a rule based world order, we have been moving to a fractured world order. The war between Russia and Ukraine, the rise of China as a Super Power, competition between China and USA, has caused new problems for cooperation among Countries for Global Science for Global Well Being. From cooperation the world order is moving towards Conflict. Science has been one of the most important contributors to the advancement of humanity. From medicine to technology, from transportation to communication, science has helped us make remarkable progress in various fields. The importance of Science has become even more evident in the present era of Globalization. The concept of global science for global good refers to the idea that science can help us address global challenges and create a better world for all. This paper will address challenges and opportunities in a fragmented world order for global science for contributing to the global good. One of the most important challenges facing humanity today is climate change. The effects of climate change, such as rising sea levels and more frequent natural disasters, are beginning to affect people around the world. The theme highlights the importance of science as a global effort towards promoting health, sustainability and

prosperity. This paper will address problems and challenges before Global Science for contributing to Global Good.

OP3. PREDICTION OF SALES OF APPAREL USING INTELLIGENTTECHNOLOGIES- A PROPOSED METHODOLOGY

Twinkle Bedi[1], Anil Pandit[2], Nidhi Gautam[3]

[1] Dr.SSBUICET, PU, Chandigarh, [2]GNA UNIVERSITY, Phagwara, Panjab, [3]UIAMS, Panjab University, Chandigarh

ABSTRACT

The fusion of machine learning and big data has revolutionized business operations, enabling them to extract valuable insights from customer data, support informed decision-making, and refine predictive accuracy. The fashion industry faces unique obstacles in accurately predicting product demand. These challenges arise from the fleeting nature of fashion items, limited historical data access, unpredictable market fluctuations, and the sway of seasonal trends, demanding the development of more proficient forecasting models. This research introduces a specialized forecasting system designed for online fashion retail. It leverages data from an online fashion retailer, encompassing details on articles, customer profiles, and transaction histories, to elevate the precision of demand forecasting. Employing machine learning and deep learning techniques on this consolidated dataset, with Python as the primary programming language, advanced preprocessing methods like label encoding and normalization are employed to refine model accuracy. The study relies on supervised machine learning regression algorithms and artificial intelligence approaches to pinpoint the most suitable model based on performance metrics, with a particular emphasis on the RMSE score during the evaluation. Subsequently, the chosen model is seamlessly integrated into a web-based application using Flask, a Python micro-framework. This web application serves the purpose of predicting sales and identifying fashion trends, harnessing the capabilities of the selected model. The results highlight the effectiveness of this proposed forecasting model in addressing the distinct challenges posed by the fashion industry, demonstrating promising outcomes across a variety of product items.

OP4. IRIS SEGMENTATION USING DEEP LEARNING METHODS

Anju Krishna[1], Preeti Gupta[1], Sumit Budhiraja[1]

[1]ECE Department, UIET, Panjab University Chandigarh

ABSTRACT

Biometric technology has become more and more well-liked globally over the recent past. Now, fingerprints, iris patterns, and facial features are the most often used biometric IDs. Amid, the identification of living people through their irises has emerged as a well-established biometric technique, finding use in a variety of applications like unlocking mobile devices, easing border crossings, enabling voter registration, and ensuring voter records are free of duplicates. Interesting modern developments suggest the possibility of posthumous identification of people based on their distinctive iris patterns. Iris segmentation plays a crucial role in the framework of iris recognition systems since it is essential for obtaining precise information from the iris and has a significant impact on recognition accuracy. In the segmentation module, the iris is localized in the image, and the areas related to the eyelids, eyelashes, reflections, and shadows are also eliminated. Deep learning, a subfield of artificial intelligence that uses statistical methods to learn from data, has seen an explosion of interest

in recent years due to its ability to recognize patterns in data with less need for human instruction. As with many other computer vision problems, deep learning-based frameworks have recently been pushed as offering consistent improvements over the state-of-the-art for the iris segmentation problem, with several models being put forth. This study compares 3 models such as U net, YOLO, and SAM to enhance the performance of iris segmentation. To facilitate accurate training and validation, annotate different publicly available datasets such as CASIA-Iris-Degradation-Database, CASIA-Iris-Thousand and IITD dataset.

OP5. WHITE BOX VERIFICATION OF DECODER BLOCK OF A HIGH SPEED PROCESSOR USING UVM

Anju Kumari[1], Shyam Vinay[2], Charu Madhu[1]
[1]UIET, Panjab University, Chandigarh, [2]SCL, Mohali

ABSTRACT

As we strive for greater performance in modern processor designs, the complexity of their functional units, such as the decoder block, increases significantly. The decoder unit plays a crucial role in interpreting and decoding instructions, which directly impacts the overall processor's efficiency and functionality. Ensuring the correctness and reliability of this critical component is of utmost importance to guarantee the processor's proper operation. The objective of this work is to carry out white box verification of decoder block of a 4-way wide RISC-V superscalar processor designed by SCL, Meity, India. The Verification environment is developed using Universal Verification Methodology (UVM). UVM is a widely adopted verification methodology (written in SystemVerilog) in the semiconductor industry, offering robust techniques to verify complex hardware designs. The simulation is conducted using Synopsis VCS software. The research focuses on developing a verification environment that facilitates exhaustive testing and analysis of the decoder block. The work encompasses the creation of an efficient UVM testbench, generation of diverse instruction sequences using contained random approach, design of scoreboard to check the response of the DUT and the implementation of functional coverage metrics to ensure test completeness. Finally, the paper presents the results of the verification process, demonstrating the effectiveness and thoroughness of the UVM-based methodology. It discusses the achieved functional coverage and provides valuable insights into potential optimizations and improvements to the decoder block's design.

OP6. MINUTIAE-BASED AUTOMATIC FINGERPRINT RECOGNITION USING CNN

Ashita Manchanda[1], Roopali Garg[1]
[1]UIET, Panjab University, Chandigarh

ABSTRACT

One of the most effective techniques for identifying a person is based on biometric fingerprint recognition. It uses unique fingerprint characteristics called minutiae that are spots where a curve track ends, crosses another track, or splits off, forming a distinctive pattern. Automatic Fingerprint Identification System (AFIS) are designed based on these traits. A fingerprint

matching algorithm examines two input fingerprints and outputs a binary decision or a degree of similarity with no loss of generality. Though there are multiple algorithms for fingerprint matching in the literature, their performance is limited by numerous challenges like unstructured data and background noise, missing structures when algorithms are dependent on minutiae or alignment of singular structures, and insufficient public databases. Therefore, for efficient minutiae identification pre-processing using Gabor filter is applied for image enhancement that represents minute details like ridge bifurcation and ending. The classification problem is resolved using a proper convolutional neural network (CNN) using a five-layer convolutional model and appropriate filter sizes. The Sokoto Coventry Fingerprint (SOCOFing) Dataset, a biometric fingerprint database of 6,000 photos from 600 African participants is used for study. The empirical analysis demonstrates that the proposed approach is superior to previous approaches and achieves good performance even when the majority of fingerprints are of low quality. Further, fine tuning of the various parameters of the CNN model will be carried out and tested on various benchmark datasets to assess the generalization capabilities of the proposed CNN architecture.

OP7. STUDY OF DIFFERENT METHODS FOR PRODUCTION OF ALTERNATE FUELS USING USED REFINED OIL

Sonia Sharma[1], Jodh Singh[1], Pravjot Kaur Panesar[1]

[1] *Dr. S.S. Bhatnagar University Institute of Chemical Engineering and Technology Chandigarh*

ABSTRACT

In recent days the petroleum price is an alarming concern due to which the research has been inclined towards alternate fuels. Alternate fuels have gained importance due to its environmental advantages and the depletion of fossil fuel resources. The basic advantage of this fuel is the availability of natural and renewable raw material for its production. Alternative fuels are the promising candidate for partial substitute of mineral diesel oil, but the one difficulty which is faced is the commercialization of alternative fuels in comparison to petroleum-based diesel fuel. In this review paper, the focus is made on the production of alternative fuels using used refined oil by several methods mainly focusing on the method of transesterification and the types of reactor to be used with various amount of catalysts. Alternate fuels produced by transesterification method has the advantage of two alcohols because this method includes the mixture of methanol and ethanol. So the feedstock feed that is used in refined oils is for the production of alternate fuels.

OP8. COMPUTATIONAL MODELING OF DIHYDROPYRIDINE ANALOGS AND THEIR BINDING AFFINITY WITH TARGET PROTEINS

Ruhani Raj[1], Anupreet Kaur[1], Minakshi Garg[1]

[1]Department of Biotechnology, University Institute of Engineering & Technology, Panjab University, Chandigarh

ABSTRACT

Hypertension is a worldwide problem that affects people of all ethnicities and social groups. The mortality rate has been steadily increasing. However, several pharmacological compounds have been used to manage hypertension and related issues. Calcium channel blockers (CCBs) based on dihydropyridines (DHPs) are used as first-line therapy. It is well established that simple adjustments to an existing medicine's fundamental structure can considerably improve its efficacy. This research aimed to create potential antihypertensive drugs utilizing a 1,4-DHP scaffold and analyze their binding processes with calcium channel proteins with Protein Data Bank ID 3LV3. This study used molecular docking and ADMET profiling to predict the binding efficacy of newly produced potential drugs such as calcium CCBs. The binding energy of the protein with the newly created compounds ranged between -2.6 and -7.26 kcal/mol (AutoDock 4.0). Ligand 4 with the protein turned out to be the most active compound, had the lowest binding energies of -7.26 kcal/mol, lower than the standard market drugs, amlodipine(-2.6 kcal/mol) and nifedipine(-5.63 kcal/mol). However, ADMET profiling of this compound was subpar. Ligand 60 and 13 showcased overall good results and a working ADMET profile.

OP9. METALLIC GRATING COUPLER FOR QUANTUM WELL INFRARED PHOTODETECTOR

Sandeep Kour[1], Sona Das[2], Jaget Singh[1], Sudipto Das Gupta[2]

[1]Department of Electronics and Communication Engineering, UIET, Panjab University, Chandigarh, [2]Semi-Conductor Laboratory, Ministry of Electronics & Information Tech, SAS Nagar, Mohali, Punjab

ABSTRACT

Quantum well infrared photodetectors (QWIP) based on GaAs technology are attractive for long-wavelength infrared (LWIR) detection because of the matured GaAs growth and fabrication technology. Since the QWIP relies on intersubband transition, gratings are essential passive components for enabling normal incidence absorption in the quantum wells. In this work, Aluminium (Al) metal gratings with different periodicities (d) were fabricated on GaAs substrate and characterized using an FTIR spectrometer at room temperature. From the transmission dip which is due to localized surface Plasmon resonance, grating parameters were optimized for different operating wavelengths of the QWIP. To study the absorption in the QWIP, simulation is performed using Silvaco TCAD software by incorporating the optimized grating parameters. The QWIP structures corresponding to the transmission dip for the particular grating period (d) have been designed by solving the self-consistent Schrödinger-Poisson. It is important to mention here that the wavelength corresponding to the transmission dip is the cut-off wavelength at which the maximum required electric field

component for the QWIP is expected. The absorption enhancement in the QWIP due to gratings has been compared with that of the 45° facet geometry. For the QWIP with the cut-off wavelength, λ=10 μm, the grating provides an absorption enhancement by 15.36 % as compared to the 45° facet geometry. This work enables a simple technique to characterize the gratings for the QWIP as well as present various QWIP structure parameters.

OP10. FORECASTING POVERTY RESULTING FROM THE EFFECTS OF CLIMATE CHANGE USING MACHINE LEARNING

Seeha Khera[1], Raj Kumari[1]
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ABSTRACT

The advancement of Machine Learning and Deep Learning technologies has thrust the field of Computer Science into the forefront of addressing real-world issues. Climate change stands out as a particularly urgent global problem, with adverse effects on India's climate becoming increasingly evident. The nation has witnessed a surge in precipitation, rising water levels in rivers and seas, and a corresponding increase in catastrophic events like floods, hurricanes, and storms. These climate-related changes ripple across various aspects of society, including healthcare, infrastructure adaptation due to diverse terrains, and the frequency of natural disasters. Poverty, a long-standing challenge in India, has also felt the impact of climate change. While the Indian government has persistently worked to combat poverty since the time of independence, it is now apparent that climate change is influencing poverty in distinctive ways. These socioeconomic challenges pose significant hurdles, particularly for developing countries.In this study, we employ machine learning techniques to analyse the prediction of poverty based on the influence of climate change. Our approach utilises a combination of climate, environmental, and demographic data to identify and assess poverty levels. Instead, our research harnesses the power of machine learning to enhance the efficiency and accuracy of poverty prediction. The prediction model encompasses a range of parameters, including temperature, precipitation, elevation, vegetation indices, soil characteristics, evaporation, population density, proximity to major urban centres, nocturnal light intensity, and land usage. We systematically preprocess the data and subsequently apply different machine learning algorithms revolutionise the prediction of poverty, offering greater efficiency.

OP11. OPTIMIZATION OF SPECTRUM UTILISATION PARAMETERS IN COGNITIVE RADIO USING GENETIC ALGORITHM

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ABSTRACT

The dramatically development of wireless technologies in the last few decades, leads to the growth of channel resources demand in a limited spectrum with inextensible character. Cognitive radio network (CR) is a promising technology that provides solutions for the

spectrum management and optimization problems via dynamic spectrum management. The spectrum resources management and optimization are an important part of the future network performances. In this paper, we propose an efficient algorithm to examine the design specification issues regarding the choice of optimal power, optimal speed, and optimal amount of information in a wireless network along with studying the effect of different parameters on the obtained results. Results show that our proposed work leads to an efficient utilization of radio spectrum and strongly contributes to alleviating the spectrum scarcity problem. This paper presents the problem formulation, development, and use of a robust dynamic genetic algorithm (GA) for channel allocation in cognitive radio. The proposed dynamic genetic algorithms based on the new sophisticated crossover and mutation operators ensure the validity of channels and the fast convergence to the best solution in a highly dynamic environment. Compared with existing methods, simulation results demonstrate that our approach algorithm produces satisfactory results with reduced network interference and enhance efficiently the spectrum throughput.

OP12. FEATURE EXTRACTION USING SPECTRAL ANALYSIS AND DISCRETE WAVELET ANALYSIS FOR THE CLASSIFICATION OF COGNITION IN PARKINSON'S DISEASE

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ABSTRACT

Cognition (brain function) plays an important role in Parkinson's disease (PD), affecting patients' daily activities and their overall health. Cognitive impairments in PD include difficulty with memory and decision-making. Early detection of cognitive impairment can lead to timely interventions, as well as contributions to ongoing research and drug development initiatives. In this work, a comparative analysis of feature extraction approaches is used on EEG data for the classification of cognitive states in PD. Two approaches: frequency domain spectral analysis and time-frequency domain discrete wavelet transform (DWT) are used for the feature extraction. The dataset consists of 40 EEG recordings obtained from the North Shore Health Institute, Chicago. In the first experiment, spectral analysis is used to extract frequency-related information from EEG data. A random forest classifier is used to accomplish the classification of four categories i.e. HC, PD-NC, PD-MCI and PDD, which resulted in an accuracy of 91% and an AUC score of 99%. While in the second experiment, the discrete wavelet transform (DWT) is used to extract the features from the same EEG dataset. The use of DWT resulted in significant improvements in classification accuracy, with a 94% accuracy and a AUC score of 99.5%. These results highlight the benefits of time-frequency domain analysis over classic spectral approaches for EEG-based cognitive categorization. In conclusion, this study highlights the superiority of time-frequency domain feature extraction methods in characterizing EEG patterns related to cognitive states in Parkinson's disease.

OP13. PIEZOMETRIC RESPONSE (CURVE) FIT OF NANO-REINFORCED ETHYLENE PROPYLENE DIENE MONOMER/BUTYL RUBBER HYBRID NANO-COMPOSITES USING AN OPTIMIZED EMPIRICAL MODEL

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ABSTRACT

Various high-performance strain sensors designed to monitor alterations in physical attributes, have gained attention from academia and industry. In this study, a highly sensitive and flexible strain sensor employing solution blending technique has been developed. The ethylene propylene diene monomer/butyl rubber is reinforced with sonicated multi-walled carbon nanotubes (MW-CNTs) and graphene (GR) sheets. The EPDM/BR hybrid strain sensor demonstrates exceptional dynamic performance, remarkable sensitivity, impressive tensile strength and toughness (stress exceeding 24 MPa), remarkable durability (withstands approximately 10,000 cycles at a 10% strain), and a broad working range for stretching (strain surpassing 200%). The developed EPDM/BR hybrid strain sensor finds applications in electronic skins (e-skins) and monitoring human body motion. This study also introduces an optimized empirical equation designed to describe and predict the piezometric response over time on application of strain. This empirical model is employed to generate a curve that accurately fits the actual piezometric response. Moreover, this method can serve as a valuable tool for effectively describing the sensor's response during further operations.

OP14. ENHANCING WIRELESS NETWORK SECURITY THROUGH AI AND ML TECHNIQUES

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ABSTRACT

Wireless networks have become integral to modern communication systems, facilitating seamless connectivity and information exchange. Traditional security mechanisms are often inadequate to counter the evolving sophistication of attacks, necessitating innovative solutions. This research paper explores the utilization of Artificial Intelligence (AI) and Machine Learning (ML) techniques to bolster the security of wireless networks by outlining the escalating challenges posed by various security threats in wireless networks, including unauthorized access, data interception, and denial-of-service attacks. It underscores the limitations of conventional security measures in addressing these threats, thereby emphasizing the demand for more adaptive and intelligent approaches. Subsequently, the paper delves into the integration of AI and ML methodologies into wireless network security. It elucidates how AI-driven algorithms can facilitate predictive analysis and anomaly detection, enabling network administrators to anticipate and threat potential attacks in real-time. ML techniques are explored in their capacity to discern patterns within network traffic data, enabling the identification of anomalous behavior that may signify security breaches. Moreover, the paper discusses the implementation challenges and considerations associated with deploying AI and

ML in wireless network security. Issues such as data privacy, algorithm robustness, and computational overhead are addressed, providing insights into ensuring the effective and ethical deployment of these technologies. In conclusion, this research paper underscores the transformative potential of AI and ML techniques in fortifying wireless network security. By harnessing the power of intelligent algorithms to analyze network behavior and proactively respond to threats, organizations can significantly mitigate vulnerabilities and safeguard sensitive data.

OP15. MAPPING INTERDISCIPLINARY APPROACHES IN CONTEMPORARY DESIGN PRACTICES FOR SUSTAINABLE OUTCOMES

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ABSTRACT

Interdisciplinarity draws on the evaluation, synthesis and harmonious blending between disciplines to form a harmonious cohesive entity. The interesting space developed by interdisciplinary practices within the creative domain, is beyond the conventional definitions of art, design and fashion as a practice and as a discipline. With the infinite exploration in new media and materials, technical advancement, the boundaries and traditional definitions of art, craft, design, fashion, textiles have become harder to map and are expanding to different modes of visual presentation. Interdisciplinarity, aligns with sustainable development, as in interdisciplinary knowledge acquisition and accompanying ability to collaborate across disciplines lies the answers to the challenges stemming from the rapid pace of technological advancements in our knowledge-based society. This paper is an attempt to map these interdisciplinary practices in India in the field of textile, embroidery, fashion and art and further explore their significance in sustainable development. The study attempts to weave the intersection of fashion, design and art through the practices of Indian fashion and textile designers and discover their impact on sustainable outcomes.

OP16. INNOVATIVE MINDS, RESILIENT COMPANIES, STRONGER COMMUNITIES: THE SOCIETAL SIGNIFICANCE OF INTELLECTUAL CAPITAL, GOVERNANCE AND FAMILY ON BUSINESS PERFORMANCE

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ABSTRACT

In this era of rapid technological developments and shifting economic landscapes, the intricate interplay between businesses and society has become more evident than before. At the core of this dynamic relationship lies the concept of intellectual capital. Due to the increasing complexity in the environment, the significance of understanding how intellectual capital

interacts with corporate governance, family influences, and impacts the financial well-being of businesses cannot be overstated. The research aims to explore the multifaceted relationships among these concepts. Throwing light upon these intricate mechanisms, the research aims to shape a future where prosperity is not only measured in financial terms but in sustainable growth and well-being of all stakeholders. Content analysis of the annual reports of top 500 BSE-listed companies was undertaken to understand intellectual capital disclosures. Further, data was collected for corporate governance, family variables and financial performance and relationships were analysed using the panel data analysis. The results would encourage companies to adopt better governance practices contributing to transparent disclosures, greater accountability and responsible management. Guiding the family-owned businesses, the results would ensure longevity and success across generations boosting economic development. The results would incentivize companies to invest in research and innovation; helping them to focus on sustainable financial success. Further, the results would help policymakers to develop regulations and policies that encourage companies to prioritize intellectual capital. Overall, the research holds the potential to create a ripple effect across the business landscape driving them to think about wealth beyond numbers and contribute to the society's welfare.

OP17. IMAGE DEHAZING ALGORITHM USING FUSION AND CONTRAST ADJUSTMENT

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ABSTRACT

Adverse weather conditions often lead to a decline in visibility when capturing outdoor images, consequently diminishing their visual appeal. Addressing this issue falls within the domain of image dehazing, a vital image-processing task. This paper introduces an innovative image dehazing framework that leverages a fusion technique involving multiple images generated from contrast adjustment of hazy images at different levels. A comprehensive experimental assessment, encompassing both qualitative and quantitative analyses, is presented. The results obtained demonstrate the effectiveness of contrast-adjusted images in eliminating the adverse impact of haze, even in challenging scenarios where conventional image dehazing techniques struggle to yield high-quality outcomes.

OP18. OPTIMIZING COMPUTATIONAL OFFLOADING USING MOBILE EDGE COMPUTING

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ABSTRACT

Mobile Edge Computing (MEC) has emerged as a transformative paradigm in the realm of mobile computing, offering a decentralized infrastructure that brings computational resources closer to mobile devices. This proximity enables efficient computational offloading, a crucial mechanism for optimizing resource utilization, reducing latency, and enhancing the overall user experience. Mobile devices have become ubiquitous in our daily lives, capable of running

a wide range of resource-intensive applications. However, the limitations of their hardware, energy constraints, and the demand for real-time responsiveness pose significant challenges. Computational offloading, the process of migrating computational tasks from mobile devices to nearby edge servers, addresses these challenges by harnessing the capabilities of MEC. By doing so, it leverages the proximity of edge servers to mobile devices, reducing latency, conserving battery life, and enabling the execution of complex tasks that would otherwise be infeasible on resource-constrained devices.

OP19. EXPOSEG- AN ALL-IN-ONE NETWORK FOR EXPOSED TISSUE SEGMENTATION

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ABSTRACT

A network ExpoSeg introduces a modified UNet neural network architecture, designed for the precise segmentation of critical anatomical regions, including the palpebral conjunctiva, tongue, palm, and nailbed. This network configuration integrates an encoder path for capturing contextual information and a decoder path for achieving precise localization. A key feature of this architecture is the incorporation of skip connections, allowing for the seamless concatenation of feature maps from both the encoder and decoder stages. In the experimental phase, input images are standardized to 512×512 pixels, with RGB intensities normalized to a range of 0 to 1. The dataset is thoughtfully partitioned into training, validation, and testing subsets in a 70:20:10 ratio. To bolster the model's robustness, real-time data augmentation techniques are employed during training, encompassing horizontal and vertical flips, random rotations (up to 50 degrees), zooming (up to 0.2), and width and height shifts (up to 0.2). The network is rigorously trained for 100 epochs, utilizing the Adam optimizer with a learning rate of 0.001, binary cross-entropy loss, and a batch size of 16. Notably, the model's performance is evaluated using key segmentation metrics, which yield promising results: For the conjunctiva, accuracy of 96.7% IoU of 74.75%. For tongue, accuracy of 95.57% IoU 94.25%. For palms, accuracy of 97.22% IoU of 98.57%. For nails accuracy of 97.44% and IoU of 85.72%. These exceptional results highlight the model's proficiency in accurately segmenting the specified anatomical regions.

OP20. INDUSTRY INITIATIVES TO SLOW DOWN THE ONGOING RACE IN FASHION LANE

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ABSTRACT

Fashion has always been an integral part of human life in defining a person’s identity, status and taste. Along with that it has created an urge of staying updated with the latest styles among consumers. Fashion is a representation of the social, political, economic and artistic forces at

any given time (Frings 2008). The word "fast" in fast fashion refers not only to the speed of production, but also to the speed with which consumers want continuous novelty (Joy and Pena 2017). It pushes out new designs of poor quality at cheap prices which are meant to be worn a few times and discarded afterwards. The amount of waste generated by apparel industry increased exponentially which sits their polluting the environment and both the consumer and the industry partly act oblivious to the situation. As India's economy grows, the middle class is predicted to grow by 1.4% every year between 2018 and 2023, and as more and more people move into the middle class, they gain access to goods that eventually contribute to the world's pollution which includes discarded textile and clothing products. (Tryphena & Aram, 2023) A few groups and brands have come forward with initiatives that help strike a balance between the demand and the environment viz., take back initiatives, renting the fashion etc. In this study the researcher explores the impact and amount of damage that has been inflected on the earth and methods adopted by brands and consumers for sustainable fashion practices.

OP21. IMAGE COMPRESSION OF MEDICAL IMAGES USING A SERIES OF LOSSY AND LOSSLESS ENCODERS

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ABSTRACT

Image compression aims to reduce the inherent redundancy present in the different types of images. Medical images like magnetic resonance imaging (MRI) and computed tomography (CT) scan can take up a lot of space in RAM and therefore, needs a high bandwidth for transmission of images. Therefore, Image compression is necessary to eliminate its inherent redundancy to reduce the storage space and bandwidth for the efficient transmission of the images from one place to another. Lossy compression techniques are preferred over lossless compression techniques to achieve high compression, but this leads to the loss of important parts of the image, or we can say diagnostic information of the image in the case of medical images. Therefore, this paper proposes the integration of lossless encoder with a lossy compression algorithm to achieve a high compression rate while preserving the image quality. In the current paper, lossy compression algorithms Discrete wavelet transform (DWT), Set partitioning in hierarchical trees (SPIHT) are integrated with lossless encoder to increase the compression rate while maintaining the same bit rate which results in the retrieval of good quality image at receiver side. Performance evaluation of the proposed method is done by comparing the parameters like peak signal to noise ratio (PSNR), mean square error (MSE) and compression ratio (CR) with lossy techniques DWT and SPIHT.

OP22. A BRIEF REVIEW OF DOPING METHODS IN NANOSCALE NOVEL MOS ARCHITECTURES

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ABSTRACT

With device dimensions shrink to just a few nano meters, conventional doping methods such as ion implantation, thermal diffusion, and in-situ dopant growth are reaching their technological constraints. Doping nano-scale devices with novel materials, having vertical geometry and architecture such as nanowires, nanotube, etc. is presenting an additional challenge, primarily due to the intricate dynamics involved in the growth of such structure. Controlling the type, level and distribution of doping in these systems becomes a complex task. To address the constraints posed by chemical doping at the nanoscale in semiconductor devices, Electrostatic Doping (ED) has emerged as a widely explored alternative. ED strives to substitute donor and acceptor dopant species with freely generated electron and hole charges induced by the gates within ultrathin MOS structures. This research paper provides an overview of various ED methods and associated device designs with different channel materials. It emphasizes the significance of metal and semiconductor work functions, energy bandgap and applied electric fields in the context of induced ED, elucidating their interplay. Additionally, the advantages of ED devices are underscored, and the key challenges these approaches face in the context of potential future CMOS technology are addressed. The ultimate advantage of ED lies in its potential to enable the creation of novel devices with enhanced performance and functionality, which can be valuable in the context of reconfigurable integrated circuits.

OP23. LENDING VERISIMILITUDE TO THE RETAILING BY USING AUGMENTED REALITY AND VIRTUAL REALITY: A BIBLIOMETRIC ANALYSIS

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ABSTRACT

Immersive technologies have transformed business landscape. Of all the sectors, visible changes have been witnessed by retail sector. Technologies like Augmented Reality (AR) and Virtual Reality (VR) have completely altered the way customers and retailers view, experience and purchase/sell the products/services. These technologies beside improving customer experience also help retailers to optimize the business processes by reducing the cost, capturing market, and increasing revenue by providing better visualization of the product/services. Since these technologies are shaping the new marketspace, it becomes crucial for the researchers to understand their current trends, future prospects, antecedents to their adoption and their impact on the businesses. This paper intends to fill in this gap in the study by undertaking a bibliometric analysis on the researches on AR/VR in online retail

focusing on its underlying factors, motivations, outcomes, theoretical foundations, and future directions. The study conducted a bibliometric analysis of 201 articles from Scopus database. Data was analysed using VOS with the help of techniques like co-citation, co-occurrence and keyword analysis. The results of the study highlighted the antecedents of AR & VR adoption in retail, moderators of AR & VR acceptance and outcomes of AR & VR acceptance in retail. This study also provides researchers with framework to work on new areas related to application of AR & VR in retail.

OP24. ENHANCING NEXT-GEN NETWORK BASE STATIONS THROUGH EFFICIENCY OPTIMIZATION

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ABSTRACT

The impending deployment of next-generation networks underscores the imperative to enhance energy efficiency (EE) within network infrastructures. A pivotal focal point lies in mitigating energy consumption within base stations (BS), which constitute a substantial portion of the overall energy usage. This research delves into the innovative utilization of optimization techniques to elevate the energy efficacy of upcoming network BS. By exploring a range of optimization methodologies, this study aims to address the intricate challenge of minimizing energy consumption while preserving operational effectiveness. Various optimization approaches, including traditional algorithms and nature-inspired techniques, are evaluated for their applicability in the context of base station EE enhancement. Through extensive simulations and comparisons, the performance of these optimization techniques is quantitatively assessed, shedding light on their respective capabilities and limitations. The study aims to determine which optimization methods yield the most substantial energy savings while maintaining the required quality of service standards. The outcomes of this research hold profound implications for the sustainable evolution of network infrastructures. As the industry marches towards next-generation networks, this optimization of energy becomes paramount for meeting environmental targets and ensuring long-term network viability. In conclusion, this study contributes to the growing discourse on energy-efficient network design by investigating optimization techniques for this purpose. The findings offer valuable insights into selecting appropriate optimization methods and motivate further exploration in the realm of energy-efficient networking.

OP25. RECENT ADVANCEMENTS IN PSEUDOCEREAL BASED GLUTEN FREE BREAD DEVELOPMENT AND ITS IMPACT ON NUTRITIONAL STATUS

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ABSTRACT

Due to the rising number of healthy, gluten-intolerant people who want to adopt a gluten-free diet, there has recently been a surge in demand for gluten-free (GF) goods. Since gluten-free bread (GFB) is a common dietary item, several recent research have examined its nutritional benefits. A summary of the existing components and nutritional labelling for GFB products has not yet been given, nevertheless. Based on research that were published in the previous ten years (2012–2022), this study sought to compile the most recent data on the substances most frequently used in GFB formulations and the nutritional quality of these products. Our investigation revealed that GFB had a lower protein and a greater fat content than bread that included gluten. Studies have shown that most products have a high glycaemic index, which is linked to the widespread usage of rice flour and starch as the primary components in GFB composition. The data acquired from the chemical analysis of fibre and other nutritional components differed significantly from that found on the label. Other issues that have been brought up regarding possible vitamin deficiencies as GFB does not frequently fortify foods with micronutrients. The nutritional value of commercial GFB is a critical problem that requires attention. This review's goal is to evaluate our current understanding of how a gluten-free diet affects one's nutritional status.

OP26. DAIRY BASED PROTEIN AS A PROMISING BIOPOLYMERIC VEHICLE FOR LOADING OF NUTRACEUTICALS

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ABSTRACT

This study evaluated the use of dairy protein hydrogel as a carrier of curcumin. The nutraceuticals have limitations like low water solubility, chemical instability at neutral and alkaline pH, auto-oxidation, less absorption. Due to such limitation's different carriers are used to improve the effectiveness of these bioactive compounds. In this study, whey protein hydrogel enriched with curcumin was prepared. The curcumin was extracted from turmeric using Soxhlet Apparatus. The hydrogel was formed by heating the protein solution at 90 degree C followed by ultrasonication. After that with curcumin as a bioactive cargo, the potential application of Whey protein as carriers was investigated. The curcumin of concentration of 1 mg/ml was successfully loaded into the whey protein hydrogel. The FTIR confirmed the formation of hydrogen bonding in curcumin whey protein hydrogels. The surface characterization of the hydrogel was investigated using SEM technique. Also, hydrogel possess a high swelling capacity. The contact angle was increased in curcumin

loaded hydrogel by 12.4 degree due to the hydrophilic character of curcumin. The antioxidant property of the hydrogel was improved by 72percent after the addition of curcumin.

OP27. FINITE ELEMENT STATIC STRUCTURAL ANALYSIS OF ALUMINIUM NITRIDE AND STEEL 1008 EXHAUST VALVE MATERIALS FOR IC ENGINES

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ABSTRACT

Valves play a crucial role in the efficient operation of engines. Intake and exhaust valves are responsible for regulating the flow and exchange of gases within the engine. These valves ensure a tight seal within the cylinder, and their opening and closing are controlled by the valve train mechanism. The smooth operation of internal combustion engines is made possible by the exhaust valve, which is responsible for directing exhaust gases from the combustion chamber to the exhaust manifold. However, during this cycle, exhaust valves are exposed to high temperatures and pressures, reducing the engine's life and performance. Using Finite Element Analysis, the goal of this project is to design an exhaust valve for a four-stroke diesel engine using a suitable material Therefore, the focus of this study is to perform static structural analysis on the compression engine Aluminium Nitride and Steel 1008 exhaust valve material for IC engine. We compare the stress, strain, and total deformation values of conventional exhaust valves. The investigations are carried out by using ANSYS.

OP28. AN INDIAN ROADS DATASET FOR SUPPORTED AND SUSPENDED TRAFFIC LIGHTS DETECTION

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ABSTRACT

Population of autonomous vehicles are growing rapidly in developed nations like America, Europe and China. Technology giants like Google, Tesla, Audi, BMW, and Mercedes are manufacturing highly efficient self-driving vehicles. However, developing countries like India, Thailand and Africa have not ventured in this field. This paper presents a thorough comparison of the existing datasets of the developed countries and India. This research introduces a new dataset ‘Dataset for Indian Roads”(DIR) which is based on more than 8000 annotations extracted from 3000+ images shot using a 64 (megapixel) camera. This dataset exceeds previously developed Indian traffic light datasets in size, annotation and variance. A comparative analysis drawn on the basis of different parameters like size, capturing device, number of cities and variations of traffic light orientation suggests that the new IRD is an improvement on the earlier version of the Indian datasets. The new datasets are available at: https://sites.google.com/view/ird-dataset/home

OP29. COMPARATIVE STUDY FOR PREDICTING DYE REMOVAL BY ALGAE-BACTERIA

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ABSTRACT

The study revolves around the assessment of machine learning (ML) models used to predict the efficiency of removing Remazol red 5B dye in an algae-bacteria symbiotic biosorption process. The investigation involves four distinct ML models: Decision Trees, Random Forest, Support Vector Regression, and Artificial Neural Networks. The decision tree model's prediction capability was demonstrated by estimating the degradation efficiency of a test sample with specific conditions, yielding a forecasted degradation efficiency of 81%. The R2 values for RF, SVR, and ANN models were 0.98, 0.87, and 0.90, respectively, reflecting their prediction accuracy. The Random Forest model excelled with an exceptional R2 coefficient of 0.98, indicating remarkable predictive accuracy. Additionally, Support Vector Regression and Artificial Neural Networks exhibited commendable predictive capabilities. This research significantly contributes to advancing sustainable dye removal strategies by effectively utilizing ML techniques. The comprehensive exploration of various ML approaches lays the groundwork for potential hybrid methodologies, enhancing predictive precision and operational efficiency in wastewater treatment practices.

OP30. SIAFORM - A SIAMESE TRANSFORMER FOR OFFLINE SIGNATURE VERIFICATION

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ABSTRACT

Signature verification remains a crucial field in forensic technology. The traditional convolutional neural network (CNN) approaches have limitations in capturing the global context of signature strokes due to their local neighborhood operations. In response to this, we introduce a Siamese Transformer model for signature verification, aimed at similarity or dissimilarity measurement, by enhancing global understanding while retaining sensitivity to local nuances. Our Siamese Transformer, named "SiaForm," leverages the power of the transformer architecture, originally designed for natural language processing but increasingly gaining prominence in computer vision tasks. SiaForm encodes signature images into patch sequences using a holistic encoder, enabling the learning of comprehensive global representations. Recognizing the subtle distinctions between genuine and forged signatures, we employ a decoder, which specializes in extracting discriminative local features. Experimental results demonstrate the considerable potential of our Siamese Transformer model in signature verification tasks. By incorporating dual stream attention, SiaForm achieves a remarkable accuracy on publicly available CEDAR dataset reaching verification rate similar to state-of-the-art methods. Our experiments underscore SiaForm's

competitiveness compared to existing techniques, positioning it as a robust solution for offline handwritten signature verification.

OP31. MELANOMA LESION SEGMENTATION WITH ATTENTION-AUGMENTED U-NET

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ABSTRACT

In this research study, we employ the U-Net architecture augmented with an attention mechanism to precisely delineate melanoma lesions within the HAM10000 dataset, comprising 1113 melanoma images. Melanoma, a form of skin cancer, demands accurate identification for timely diagnosis and intervention. Our innovative method combines the inherent abilities of the U-Net model with attention modules, enhancing the model's capacity to capture intricate details and improving segmentation accuracy. This comprehensive approach leverages the encoding and decoding pathways inherent to the U-Net architecture, which are well-suited for naturally capturing the intricate hierarchical features of the lesions. The incorporation of attention mechanisms enhances this process by emphasizing critical regions, thereby further enhancing the model's understanding of unique visual cues. After a 100-epoch training process, we fine-tune our U-Net model and assess its performance using essential metrics. The model achieves an Intersection over Union (IoU) score of 0.8414 and a Dice Coefficient of 0.9139, demonstrating its ability to replicate expert annotations effectively. Our research showcases visual comparisons of original images, expert annotations, and model predictions. The approach showcases current best practices and its potential for significant advancements in melanoma diagnosis. It enables early and precise lesion delineation, which can improve dermatological care by leading to quicker and more accurate diagnoses, benefiting patients' well-being.

OP32. FLUORESCENT NANOSENSORS FOR DETECTION OF FOOD TOXINS

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ABSTRACT

In recent years, India has seen exceptional advancement in the technology. While technology can be a powerful tool to improve our standard of living, it comes at a cost that adversely affects the environment and human health. The deteriorating food and environment due to presence of microbial and chemical toxic substances in food matrices have become the cause of grave concern to the health of our population at large. Conventional methods of food toxin detection such as culture-based procedures, molecular methods, and chromatographic techniques provide good results but are limited by their time-intensive, laborious, high cost, and requirement of skilled personnel, and hence cannot be used for rapid and on-site applications. Recently, fluorescence-based biosensors have gained attention due to their amazing features such as fast response time, simplicity, ease of operation, high accuracy,

sensitivity, and selectivity. The nanomaterials are being employed as catalytic tools, immobilization platforms, colorimetric, and fluorescent labels in such biosensing systems to increase their sensitivity. The detection process can be enhanced by incorporating nanomaterials such as metal nanoparticles, graphene and its derivatives, carbon-based nanomaterials, quantum dots, up-conversion nanoparticles, metal-organic frameworks, etc. The integration of nanostructured materials with biosensors can have a significant impact on the biosensor attributes such as sensitivity, selectivity, response time, sample volume, detection limits, multiplexity, and device cost. Thus, the current work includes the development of various fluorescent nanosensors for the detection of several food toxins such as aflatoxin, zearalenone, and lead ions using metal-organic frameworks and carbon quantum dots.

OP33. REMOVAL OF CRYSTAL VIOLET DYE USING ELECTROCOAGULATION PROCESS

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ABSTRACT

The textile industry, with its extensive water requirements and the generation of wastewater heavily saturated with dyes, poses a significant risk to human life. Moreover, the presence of these dyes in wastewater not only increases toxicity levels but also has the potential to cause severe respiratory tract irritation and even carcinogenic effects. Electrocoagulation (EC) is simple, cost-efficient, and reliable techniques for removing color and pollutant from wastewater. In this research, the removal of Crystal Violet, used in the textile industry, was investigated using the batch electrocoagulation process. The effects of various influencing parameters such as current density, electrolyte concentration, and initial dye concentration were studied using aluminium electrodes in the electrochemical cell to increase dye removal efficiency. The results were evaluated based on the optimal parameter values determined through analysis, where a current density of 0.3125A/cm2, electrolyte concentration of 400 ppm, and initial dye concentration ranging from 50 to 300 ppm achieved a dye removal efficiency (>98%) within 15 minutes.

ABSTRACTS OF POSTER PRESENTATIONS

PARTICIPANTS

S. No.	Name of participant	Affiliating institution	Title of abstract
1.	Gargi Kharbanda	UIFT Panjab University	Exploring the potential of the fashion industry through metaverse
2.	Kirti	University Institute of Fashion Technology and Vocational Development, Panjab University, Chandigarh	Dyeing For a Change: Crafting Sustainable Fashion with Natural Dyeing & 2. Reviving Fashion: Transforming Local Boutique Textile Waste Into Innovative Lifestyle Products
3.	Maninder Kaur	Dr. SSBUICET, Panjab University, Chandigarh	Comparative analysis of different straw pretreatment for efficient biogas production
4.	Harbaaz Singh, Meenakshi Goyal	Dr. S.S.B. University Institute of Chemical Engineering and Technology, Panjab University, Chandigarh, India	Physiochemical characteristics of a physically modified starch isolated from rice
5.	Parneet Brar	University Institute of Fashion Technology and Vocational Development, Panjab University, Chandigarh.	Influence of royals on styles of turbans of Punjab
6.	Ginni Singh, Prabhdip Brar	University Institute of Fashion Technology and Vocational Development, Panjab University, Chandigarh.	Design and construction of upcycled garments from post-consumer textile waste
7.	Satyam	Dr. S.S.B. University Institute of Chemical Engineering & Technology, Panjab University, Chandigarh	Setting properties and mechanical behaviour of multi-substituted calcium phosphate-calcium sulphate bone cement
8.	Akshay Dhiman	Panjab University, Chandigarh	Edge computing's role in IOT: Enhancing efficiency and performance
9.	Anju	UIET, Panjab University, Chandigarh	Code mixed hate speech detection

10.	Ankita Sharma	Panjab University, Chandigarh	Fabrication and characterisation of polyethylene tetraphalate with graphite nanoplatelets
11.	Sakshi, Avneet Kaur	Dr. S.S.B. University Institute of Chemical Engineering & Technology, Panjab University, Chandigarh	Investigations on electrical and optical properties of substituted calcium phosphates for biomedical applications
12.	Sahil Sharma, Damanpreet Kaur	Department of Biotechnology, UIET, Panjab university, Chandigarh	Optimization of methylene blue degradation using silicon dioxide nanoparticles through response surface methodology
13.	Ishwarpreet Kaur	University Institute of Fashion Technology, Panjab University, Chandigarh	Reviving fashion: Transforming local boutique textile waste into innovative lifestyle products
14.	Jyoti Jaiswal	UICET, Panjab University, Chandigarh	Utilization of micro algae for bioplastics generation and CO_2 removal
15.	Karan Kapoor	Department of Biotechnology, UIET, Panjab University	Scope of TiO_2 nanoparticles as fire retardants
16.	Mansi Rathore	Panjab University, Chandigarh	Production of bioethanol from fruit waste
17.	Milan Pahwa	Dr. SSBUICET , Panjab University, Chandigarh	Effect of alkaline pretreatment of bagasse and filter cake on biogas production
18.	Monika Sharma	UIET, Panjab University, Chandigarh	Evaluating neurological effects of fluorescent carbon dots using zebrafish model: A review
19.	Neeraj Sharma	Dr.SSBUICET, Panjab University, Chandigarh	Comparative analysis of different straw pretreatment for efficient biogas production
20.	Neyaz Ahmed	UIET, Panjab University, Chandigarh	Evaluating nanoparticle dosimetry in freely

			swimming zebrafish (Danio rerio) utilizing the ISDD model : A review
21.	Plash Kunj	Department of Biotechnology, UIET, Panjab University, Chandigarh, India	Production of nutraceuticals from algae
22.	Rahul Kumar Singh	University Institute of Fashion Technology and Vocational Development, Panjab University, Chandigarh	Dyeing for a change: Crafting sustainable fashion with natural dyeing
23.	Sanganpal Kour	University Institute of Engineering and Technology, Panjab University, Chandigarh	Response surface methodology based optimisation and production of agarase
24.	Sankalp Saurabh	University Institute of Engineering and Technology Panjab University Chandigarh	Zebrafish as model for studying human neurodegenerative diseases
25.	Shivam Kumar	Department of Biotechnology, UIET, Panjab University, Chandigarh-160014	Development and evaluation of PLGA/PHBV blend nanoparticles carrying Propolis-meropenem
26.	Sonal Thakur	UIET, Panjab University, Chandigarh	Screening of biological effect of Diospyros kaki leaves, Aloe barbadensis miller leaves, Morchella esculenta extracts, alone and in combination with antibiotics against wild and resistant S. aureus
27.	Sunanda	Dr. S.S.B. University Institute of Chemical Engineering & Technology, Panjab University, Chandigarh	Pluri-substituted hydroxyapatite: Synthesis and characterization
28.	Akashdeep Kaur	Energy Research Centre, SSBUICET, PU, Chandigarh	Enzyme assisted extraction of betalains from beetroot pomace (Beta vulgaris L.) and its characterization
29.	Alisha Lalhall	Panjab University, Chandigarh	Small scale, big impact: design and development of Fmoc-phenylalanine nanofibrillar hydrogel to

			combat antimicrobial resistance
30.	Anuj Sharma	UIET, Panjab University, Chandigarh	Experimental investigation of minimum quantity lubrication (MQL) machining using biofriendly coolants
31.	Arushi Puri	University Institute of Fashion Technology & Vocational Development, Panjab University, Chandigarh-14	A case study on creating sustainable art pieces
32.	Rahul Sharma	UIET, Panjab University, Chandigarh -160 014	Electrochromic and electrochemical performance study of $MoSe_2/Wo_3$ nanocomposite
33.	Ramanpreet Kaur	Dr. SSB. UICET, Panjab University, Chandigarh	Effect of pretreatment on de-oiled sunflower cake and its effect on extracted proteins
34.	Shreya Goswami	Dr. S.S.B University Institute of Chemical Engineering and Technology, Panjab University, Chandigarh, 160014, India	Photocatalytic hydrogen production by water splitting using various photocatalysts - A review
35.	Pooja Singh	Academy of Scientific and Innovative Research (AcSIR), Ghaziabad- 201002, India	Photoelectrochemical behaviour of $MoSe_2$ decorated Fe_2O_3 photoelectrode for multifunctional wastewater treatment and hydrogen generation

PP1. EXPLORING THE POTENTIAL OF THE FASHION INDUSTRY THROUGH METAVERSE

Gargi Kharbanda[1], Anu H Gupta[1]
[1]*UIFT Panjab University, Chandigarh*

ABSTRACT

The world is moving faster into the "metaverse" due to global unifying events such as Covid and War. This has resulted in people working remotely using virtual platforms as google meets, zoom or teams to communicate with other individuals. This has added the amount of time one spends in the digital world. The online platform has swiftly taken hold of every part of life, shifting the most mundane products to the immersive virtual world, with fashion being one of the key fronts for this new reality. Fashion is a powerful tool for self-expression and identity construction. In the metaverse, people can choose to express themselves through their avatars in any way they see fit, regardless of their social class. People nowadays buy virtual clothing for virtual meetings, and the function of virtual capsule wardrobe is becoming more popular. Metaverse fashion shows include the work of designers from many backgrounds and cultures. This research investigates how the metaverse may help people have more inclusive and accessible fashion experiences. This research also considers the metaverse's possible influence on the fashion industry, including the roles of fashion brands, retailers, and consumers. A survey of 200 young people from diverse classes and backgrounds was undertaken. The findings revealed that virtual fashion is gaining popularity and encourages capsule sustainable wardrobes.

PP2. DYEING FOR A CHANGE: CRAFTING SUSTAINABLE FASHION WITH NATURAL DYEING & 2. REVIVING FASHION: TRANSFORMING LOCAL BOUTIQUE TEXTILE WASTE INTO INNOVATIVE LIFESTYLE PRODUCTS

Rahul Kumar Singh[1], Ishwarpreet Kaur[1], Kirti[1], Anu H. Gupta[1]
[1]*University Institute of Fashion Technology and Vocational Development, Panjab* University, Chandigarh

ABSTRACT

1. This abstract emphasizes a sustainable approach to garment production using natural dyes, with notable benefits for the fashion industry's environmental responsibility. Natural dyes, as opposed to synthetic counterparts, offer advantages in terms of reduced water consumption during production and application, thereby minimizing environmental harm. Additionally, natural dyes do not contain harmful chemicals that can be detrimental to both wearers and aquatic ecosystem. The Experimental methodology outlined in this paper encompasses practical steps, beginning with the selection of sustainable textile materials such as organic cotton or linen. Subsequently, the sourcing and processing of natural dye materials, including plant extracts and insect-based dyes, are detailed to create dye solutions. & 2.This research investigates the transformative process of repurposing textile waste from local boutiques into innovative lifestyle products, addressing sustainability challenges in the fashion industry. The textile industry's ecological footprint remains a concern, marked by substantial fabric waste

output. Local boutiques, despite their unique fashion offerings, contribute significantly to this waste stream. This research explores the concept of upcycling as a means to extend the lifecycle of discarded materials and mitigate waste. To comprehensively understand the upcycling process, a multidisciplinary research approach was employed. Initially, textile waste samples were meticulously collected from diverse local boutiques, ensuring a broad spectrum of materials. Subsequent material assessments were conducted to identify their potential for upcycling. A range of creative techniques, including patchwork, embroidery, and fabric manipulation, were systematically applied to transform textile waste into innovative lifestyle products.

PP3. COMPARATIVE ANALYSIS OF DIFFERENT STRAW PRETREATMENT FOR EFFICIENT BIOGAS PRODUCTION

Neeraj Kumar[1], Maninder Kaur[1]

[1]*Dr. SSBUICET, Panjab University, Chandigarh*

ABSTRACT

Anaerobic digestion of different crop residues such as rice straw, wheat straw, and cotton straws for energy production has emerged as a widely used technology as it helps in utilizing waste and reducing greenhouse gas emissions. Crop residues are lignocellulosic material in nature comprised of cellulose, hemicellulose, and lignin and this lignocellulosic nature poses recalcitrance to their biodegradation through anaerobic digestion. In this study, the focus is on reviewing the various pretreatment methods available in literature such as acidic, basic, ionic, and microwave to get enhanced biogas production from different straws. The review article will help to analyze the efficient pretreatment technique of rice straw, wheat straw, and cotton straw for maximum biogas production under different conditions.

PP4. PHYSIOCHEMICAL CHARACTERISTICS OF A PHYSICALLY MODIFIED STARCH ISOLATED FROM RICE

Harbaaz Singh[1], Raj Kumar[1], Priyana Garg[1], Meenakshi Goyal[1]

[1]*Dr. S.S.B. University Institute of Chemical Engineering and Technology, Panjab University, Chandigarh, India*

ABSTRACT

Natural starch has inherent drawbacks, including poor swelling and solubility, low shear rates, and inferior heat resistance. To address these starch issues, chemical, physical, and enzymatic modification techniques have been developed and commercialized to improve the functionalities of starch. In the physical modification technique, dry heat treatment (DHT) is a toxic-free downstream and wastewater innovative technique. So, the main aim of this research is to investigate DHT's impact on the structural and physicochemical characteristics of non-waxy rice starch. SEM, X-ray diffraction, rheological properties, swelling power, solubility, and FTIR analysis are some techniques used to study starch. The results indicated that the crystal type of rice starch did not change following dry heat treatments. However, the relative crystallinity, molecular order, solubility, and swelling power all altered dramatically

following dry heat treatments. The modification of starch leads to the conclusion that its diverse properties may be aimed at different food business areas.

PP5. INFLUENCE OF ROYALS ON STYLES OF TURBANS OF PUNJAB

Parneet Brar[1], Prabhdip Brar[1]

[1]*University Institute of Fashion Technology and Vocational Development, Panjab University, Chandigarh*

ABSTRACT

This paper explores the profound influence of royalty on the evolution of turban styles in the Punjab region. Turbans have long been a symbol of identity and pride for Punjabi men, and their styles have been shaped by a multitude of historical, cultural, and social factors. However, one of the most significant influencers has been the royal families of Punjab. Through an in-depth analysis of historical records, photographs, and accounts, this paper traces the intricate relationship between the royal class and the development of distinctive turban styles. It delves into the ways in which royal patronage, preferences, and dynastic traditions have left an indelible mark on the colors, fabrics, and adornments used in Punjab's turbans. Furthermore, it examines how these royal-inspired turban styles have transcended their original context to become cultural symbols that continue to influence contemporary fashion in the region. This study sheds light on the enduring legacy of Punjab's royalty in shaping the sartorial heritage of the turban, reflecting the interplay between tradition, identity, and regal influence.

PP6. DESIGN AND CONSTRUCTION OF UPCYCLED GARMENTS FROM POST-CONSUMER TEXTILE WASTE

Ginni Singh[1], Prabhdip Brar[1]

[1]*University Institute of Fashion Technology and Vocational Development, Panjab University, Chandigarh.*

ABSTRACT

The concept of designing and constructing garments from textile waste involves repurposing and utilizing discarded or leftover fabrics to create new clothing items, reducing the negative impact of textile waste on the environment. This paper documented the process of design development and garment construction of two fashion collections that used post-consumer textile waste to construct garments. Both the collections were made under the supervision of the authors and presented on stage at the annual fashion show, 'Shears & Ruban', of UIFT&VD, Panjab University, Chandigarh. The first collection, "Denims Upcycled" by Ms. Malyca Singh, showcased an exceptional blend of creativity and sustainability by crafting garments exclusively from discarded Denim. This innovative approach involved reusing patchwork, buckles, chains, belts, and buttons from old clothing sourced from her family members. The collection featured a diverse array of designs, including patchwork dresses, deconstructed jeans, skirts, and tops with bleach art. The second collection, named "My Mini

in a Glitch" by Shreya Verma, utilized discarded apparel, sourced from friends, family and thrift stores, to create garments that seamlessly blended braids and weaves with innovation, meticulously stitched together in a glitch-like pattern. This standout collection included designs such as braided sleeves, deconstructed jackets with woven surfaces, colorful tops, and skirts composed of woven fabric strips, adorned with chains. The designer accessorized the look by adding woven and braided clutches, handbags, and colorful glasses. Both of these collections highlight the transformative power of creative vision and sustainable practices in fashion design.

PP7. SETTING PROPERTIES AND MECHANICAL BEHAVIOUR OF MULTI-SUBSTITUTED CALCIUM PHOSPHATE-CALCIUM SULPHATE BONE CEMENT

Satyam[1], Gaurvansh[1], Inayat Sodhi[1], Seema Kapoor[1], Uma Batra[2]

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ABSTRACT

Bone has a remarkable ability to regenerate under normal circumstances, with the surrounding microenvironment supporting the repair process. However, this natural healing capacity is limited to small bone defects and medical intervention is necessary for larger defects caused by infection, trauma or tumour resection. Limitations in the availability of autologous bone and the risk of infection and blood loss at the donor site restrict its widespread use. Allografts and xenografts also come with challenges such as cost, aseptic preservation requirements, disease transmission risk and potential immune rejection. As a result, the focus is shifting towards the development of biomaterials for bone defect repair. The objective of this study was to investigate the effect of addition of multi-substituted hydroxyapatite in calcium sulphate bone cement beads on the setting time, mechanical properties as well as degradation rate in phosphate buffer solution (PBS). The results of this study suggested that synergistic combination of calcium sulphate and multi-substituted hydroxyapatite in bone cement may be useful in certain clinical situations, such as filling of non-uniform bone defects and situations that require mechanical integrity of the bone graft substitute during implantation.

PP8. EDGE COMPUTING'S ROLE IN IOT: ENHANCING EFFICIENCY AND PERFORMANCE

Akshay Dhiman[1], Raj Kumari[1]

[1]Panjab University, Chandigarh

ABSTRACT

The Internet of Things (IoT) technology is emerging at a crucial point in history as a result of the quick development of information and communication technologies. It is fusing with a physical world, more and more sensors are deployed in IoT to create a smart grid. But this revolutionary changes faces several challenges such as network delay, data storage, resource congestion and computing delay. To overcome these provocation edge computing is

introduced. Today, the Internet of Things (IoT) touches every aspect of our everyday lives and offers crucial data collecting and measurement capabilities that help us make better decisions. Through intricate networks that enable machine-to-machine communications, monitoring, and control of crucial smart-world infrastructures, millions of sensors and devices are constantly producing data and sending and receiving crucial information. Edge computing is a new paradigm that has arisen to address IoT and localized computing needs as a means of reducing the escalation in resource congestion. In contrast to the well-known cloud computing, edge computing will move data computation or storage to the network's "edge," close to the end users. As a result, a number of compute nodes dispersed throughout the network can offload the burden of computation away from the central data center and can greatly reduce message exchange latency.

PP9. CODE MIXED HATE SPEECH DETECTION

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[1]*UIET, Panjab University, Chandigarh*

ABSTRACT

Hate Speech Detection in social media is an important research topic in recent times. This paper focuses on identification of hate speech in code-mixed data. Natural language processing methodology is used for preprocessing, labeling, training and testing of code-mixed data. For training the code-mixed data there are various feature extraction techniques available. A numerical metric called term frequency-inverse document frequency (TF-IDF) assesses the relevance of a certain word in a data corpus. Textual modeling feature such as Bag of Words (BOW) is used to extract numerical characteristics from text. Word Embedding is the another category of feature extraction. Word2Vec and GloVe are the two word embedding methods which are generally used. Some best Deep neural networks such as Long short term memory (LSTM), Convolutional neural network (CNN) use weights to extract features like word embedding. CNN extracts relationships between neighboring words. For testing the code-mixed data there are various machine learning algorithms and deep learning classifiers available. Logistic Regression (LR) performs extensively well with linearly separable classes. The best hyperplane for separating positive and negative data is determined using the Support vector machine (SVM). Studies show that SVM became a highly recommended algorithm for binary level categorization. Naive Bayes (NB) classifier stands out where we have limited access to training dataset in order to calculate the parameters for classification. Various Deep learning classifiers such as LSTM, Bi-LSTM and CNN have been used in systems dealing with a variety of languages.

PP10. FABRICATION AND CHARACTERISATION OF POLYETHYLENE TETRAPHALATE WITH GRAPHITE NANOPLATELETS

Ankita sharma[1]
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ABSTRACT

Polyethylene terephthalate (PET) is a widely used thermoplastic polymer known for its excellent mechanical properties and versatility. In recent years, the incorporation of graphite, a two-dimensional carbon allotrope, into polymer matrices has gained significant attention due to its remarkable mechanical, electrical, and thermal properties. This study aims to investigate the effect of graphite loading on the properties of PET nanocomposites by preparing samples with 5% and 10% graphite content. The PET/graphite nanocomposites were fabricated using a solution blending technique followed by a hot-pressing process. Scanning electron microscopy (SEM) was employed to analyze the morphology and dispersion of graphite within the PET matrix. The mechanical properties, including tensile strength. Additionally, the thermal behavior of the nanocomposites was investigated using dilatometer. The results revealed that the addition of graphite significantly influenced the mechanical and thermal properties of the PET nanocomposites. The SEM images exhibited improved graphite dispersion with a reduction in agglomeration as the graphite content increased. Furthermore, the tensile strength of the nanocomposites increased with the addition of graphite, indicating enhanced mechanical performance.

PP11. INVESTIGATIONS ON ELECTRICAL AND OPTICAL PROPERTIES OF SUBSTITUTED CALCIUM PHOSPHATES FOR BIOMEDICAL APPLICATIONS

Sakshi[1], Avneet Kaur[1], Gaurvansh Sharma[1], Seema Kapoor[1], Uma Batra[2]
[1]*Dr. S.S.B. University Institute of Chemical Engineering & Technology, Panjab University, Chandigarh,* [2]*Dept. of Metallurgical & Materials Engineering, Punjab Engineering College (Deemed to be University), Chandigarh*

ABSTRACT

Calcium phosphates have attracted much interest due to their wide range of applications in various fields of Science and Technology. They represent the fundamental mineral compound found in hard human tissues such as bone and teeth. Their widespread application includes usage as a filler in traumatology, orthopedics and hand surgery, effectively replacing lost bone. Numerous recent studies have focused on investigating the optical and dielectric properties of substituted calcium phosphates, recognizing their significance in understanding the band gap, dipole polarization and surface charge. The substitution of metal ions in calcium phosphates, based on their size, leads to alterations in the local dielectric polarization, resulting in micro and macro polarization effects. The current investigation includes synthesis and characterization of substituted calcium phosphates with various ions to develop electro-opto biomaterials for the rapid healing of bone defects and fractures owing to the enhanced bone cell proliferation and growth. The as-synthesized substituted calcium phosphates were

characterized by Fourier-transform Infrared Spectroscopy to determine the presence of functional groups, X-ray diffraction analysis to determine phases formed, estimation of crystallinity, crystallite size and lattice parameters i.e. a- axis, c-axis & volume of nanopowders and ultraviolet-visible diffuse reflectance spectroscopy (UV-Vis DRS) to determine the optical band gap.

PP12. OPTIMIZATION OF METHYLENE BLUE DEGRADATION USING SILICON DIOXIDE NANOPARTICLES THROUGH RESPONSE SURFACE METHODOLOGY

Sahil Sharma[1], Damanpreet Kaur[1], Anupreet Kaur[1]

[1]*Department of Biotechnology, UIET, Panjab University, Chandigarh*

ABSTRACT

The removal of hazardous organic dyes from wastewater, such as Methylene Blue (MB), is of paramount importance due to its harmful effects on the environment and human health. In recent years, the utilization of nanomaterials for efficient dye degradation has gained considerable attention. This study presents an investigation into the degradation of methylene blue using silicon dioxide nanoparticles as catalysts, employing the Response Surface Methodology (RSM) for optimization. The studies of kinetic photocatalytic degradation were carried out on an aqueous solution of MB dye, which contained SiO_2 nanoparticles and under an ultraviolet light source. Different parameters affecting the process have been studied: Catalyst concentration, dye concentration, reaction time, and pH of the solution. The color variation was detected at 663 nm. The experimental results demonstrate the successful degradation of MB dye using SiO_2 nanoparticles as catalysts. The RSM analysis reveals significant interactions between the studied parameters, indicating the importance of considering their combined effects on the degradation process. The central composite design (CCD)-based RSM is widely accepted for investigational design, modelling and optimization. Further, LCMS analysis has been performed to establish the degradation. In conclusion, the application of silicon dioxide nanoparticles for the degradation of MB dye presents a promising solution for wastewater treatment. The integration of RSM facilitates the optimization of process parameters, leading to enhanced degradation efficiency.

PP13. REVIVING FASHION: TRANSFORMING LOCAL BOUTIQUE TEXTILE WASTE INTO INNOVATIVE LIFESTYLE PRODUCTS

Ishwarpreet Kaur[1], Kirti[1], Anu H Gupta[1]

[1]*University Institute of Fashion Technology, Panjab University, Chandigarh*

ABSTRACT

This research investigates the transformative process of repurposing textile waste from local boutiques into innovative lifestyle products, addressing sustainability challenges in the fashion industry. The textile industry's ecological footprint remains a concern, marked by substantial fabric waste output. Local boutiques, despite their unique fashion offerings, contribute significantly to this waste stream. This research explores the concept of upcycling as a means to extend the lifecycle of discarded materials and mitigate waste. To comprehensively

understand the upcycling process, a multidisciplinary research approach was employed. Initially, textile waste samples were meticulously collected from diverse local boutiques, ensuring a broad spectrum of materials. Subsequent material assessments were conducted to identify their potential for upcycling. A range of creative techniques, including patchwork, embroidery, and fabric manipulation, were systematically applied to transform textile waste into innovative lifestyle products. Additionally, consumer feedback and rigorous market analysis were leveraged to assess the acceptability and commercial viability of these upcycled products. This research concludes the significant promise of upcycling textile waste from local boutiques. By reimagining and repurposing discarded materials into distinctive, sustainable lifestyle products, it not only reduces waste but also unlocks new avenues for creative expression and entrepreneurial opportunities. Importantly, consumer response underscores burgeoning interest in sustainable and environmentally conscious fashion choices.

PP14. UTILIZATION OF MICRO ALGAE FOR BIOPLASTICS GENERATION AND CO2 REMOVAL

Jyoti Jaiswal[1], Himanshi Bansal[2], Surinder Singh Bhinder[1]

[1]UICET, Panjab University Chandigarh, [2]Energy research center, Panjab University Chandigarh

ABSTRACT

Micro-plastic and other pollutants made of plastic are being introduced into the environment and our food chain. Research on bio-based plastic is now receiving attention in an effort to create a sustainable, greener world with a less environmental impact. The demand for bio-plastics as an environmentally acceptable substitute for traditional plastics and the urgent need to reduce carbon dioxide (CO2) emissions have both been addressed by microalgae, which have emerged as a viable and sustainable option. Bio-plastic from renewable resources can have similar yet more effective features as conventional plastics with an advantage of being Eco friendly. Microalgae are exceptionally good at capturing and using CO2 from a variety of sources, including industrial pollution. Microalgae successfully trap carbon by converting CO2 into biomass through photosynthesis, which also yields important bio-resources. Microalgae's dual function as a CO2 sink and a supplier of bio-plastics offers an effective strategy for preserving the environment. This paper focuses to assess the present status of microalgae-based bio-plastic manufacturing technologies and to identify the areas for this conversion process and applications.

PP15. SCOPE OF TIO_2 NANOPARTICLES AS FIRE RETARDANTS

Anupreet Kaur[1], Karan Kapoor[1], Rashika Saproo[1]

[1]Department of Biotechnology, UIET, Panjab University

ABSTRACT

Fire accidents pose significant threats to human lives, property, and the environment. After the invention of flame retardants. They have made the world safer by significantly reducing fire risks and reducing human and material losses. At the same time, however, environmental problems have been created and their impact on health, as the compounds that make up the

flame retardant are heavy metals. Therefore, in order to make these materials safer, efforts must be focused on using environmentally friendly ones. As a result, TiO_2 nanoparticles emerging as a noteworthy candidate for enhancing fire retardancy in various materials. TiO_2 nanoparticles exhibit exceptional flame-retardant properties due to their unique physicochemical characteristics, including high surface area, reactivity, and the ability to undergo phase transitions. This allows them to interact with the combustion process at multiple levels, influencing both gas-phase and solid-phase reactions. The incorporation of TiO_2 nanoparticles as fire retardants can be achieved through various methods, such as direct mixing, surface modification, and layer-by-layer deposition. In conclusion, TiO_2 nanoparticles hold great promise as fire retardants due to their multifaceted mechanisms of action and versatile applications. Their ability to mitigate fire hazards through interactions at both gas and solid phases positions them as valuable tools in enhancing fire safety across industries.

PP16. PRODUCTION OF BIOETHANOL FROM FRUIT WASTE

Krishna Mishra[1], Mansi Rathore[2], Janvahi Tickoo[2], Abhishek Kumar Singh[3]

[1,2,3]*Panjab University, Chandigarh*

ABSTRACT

Fruit wastes are plentiful as wastes all throughout the planet. In fact, value-added products must be recovered from these wastes. Fruit waste contains a lot of sugars and carbohydrates that can be collected and used to make bioethanol. Gasoline is used on a massive basis all over the world. If bioethanol is to replace gasoline, a large amount of bioethanol would have to be produced. The current research aims to identify cost-effective strategies to recover sugars from fruit wastes without the use of acidic or enzyme catalysts. Fruit wastes such as Banana peels, pineapple peels, and orange peels were investigated for their ability to produce total reducing sugars (TRS), pentose sugars (PS), and bioethanol. The recovery of free sugars was achieved by just soaking in water and heating. Enzymatic hydrolysis with cellulase and xylanase produced high quantities of total reducing sugars and pentose sugars. BP and PAP were discovered to be viable alternatives for bioethanol synthesis. The best conditions for ethanol production from fruit waste yields were pH 5.5, 32 °C, 0.865 specific gravity, and a concentration of roughly 6.10 %, according to the findings. We optimized for the viability of generating ethanol in big numbers at acceptable costs.

PP17. EFFECT OF ALKALINE PRETREATMENT OF BAGASSE AND FILTER CAKE ON BIOGAS PRODUCTION

Milan Pahwa[1], Maninder Kaur[1]

[1]*Dr. SSBUICET, Panjab University, Chandigarh*

ABSTRACT

Effect of alkaline pretreatment of bagasse and filter cake on biogas production Milan Pahwa, Maninder Kaur Dr.S.S.B.University Institute of Chemical Engineering &Technology, Panjab University, Chandigarh Bagasse, abundantly available crop residue has a high potential that remains unutilized or burnt as fuel. The complex structure of bagasse poses recalcitrance to its sustainable utilization through anaerobic digestion. So, to enhance biogas production 2%

NaOH pretreatment of bagasse and filter cake were carried out in this study at room temperature for 24 hours. Biogas production was observed for 40 days of retention period using a one-liter batch digester kept at mesophilic temperature. Proximate analysis and analytical technique such as Fourier Transform Infra-Red (FTIR) was used to characterize the residues and observe the effect on chemical structures of pretreated bagasse and filter cake respectively. Raw filter cake was found to produce the highest biogas production.

PP18. EVALUATING NEUROLOGICAL EFFECTS OF FLUORESCENT CARBON DOTS USING ZEBRAFISH MODEL: A REVIEW

Monika Sharma[1], Kamaljit Kaur[2], Madhu Khatri[2]

[1,2]UICET, Panjab University Chandigarh

ABSTRACT

Carbon dots (CDs), generally defined as 0D carbon nanomaterials, have emerged as a promising material for biosensing, bioimaging and drug delivery. The blood-brain barrier (BBB), is made up of tight connections between endothelial cells, therefore drug administration to the central nervous system (CNS) in biological systems remains a challenge. Tremendous research has been done to solve this problem using tryptophan as a carbon precursor for carbon dots preparation which is one of 20 essential amino acids. Tryptophan is essential for many biological processes including the production of melatonin and serotonin in the brain. Also, there is a specialized transporter to mediate in crossing the blood-brain barrier is referred to as LAT1 and two different nitrogen dopants: urea and 1,2-ethylenediamine (EDA). However, before translating such studies to humans, it is utmost important to check the safety of such carbon dots in a suitable model system. Our research is focussed on evaluating neurological effects of fluorescent carbon dots using zebrafish model.

PP19. COMPARATIVE ANALYSIS OF DIFFERENT STRAW PRETREATMENT FOR EFFICIENT BIOGAS PRODUCTION

Neeraj Sharma[1], Maninder Kaur[1]

[1]Dr.SSBUICET, Panjab University, Chandigarh

ABSTRACT

Anaerobic digestion of different crop residues such as rice straw, wheat straw, and cotton straws for energy production has emerged as a widely used technology as it helps in utilizing waste and reducing greenhouse gas emissions. Crop residues are lignocellulosic material in nature comprised of cellulose, hemicellulose, and lignin and this lignocellulosic nature poses recalcitrance to their biodegradation through anaerobic digestion. In this study, the focus is on reviewing the various pretreatment methods available in literature such as acidic, basic, ionic, and microwave to get enhanced biogas production from different straws. The review article will help to analyze the efficient pretreatment technique of rice straw, wheat straw, and cotton straw for maximum biogas production under different conditions.

PP20. EVALUATING NANOPARTICLE DOSIMETRY IN FREELY SWIMMING ZEBRAFISH (DANIO RERIO) UTILIZING THE ISDD MODEL: A REVIEW

Neyaz Ahmed[1], Kamaljit Kaur[2], Madhu Khatri[2]
[1,2]*UICET, Panjab University Chandigarh*

ABSTRACT

Metal and metal oxide nanomaterials (ENMs) have seen exponential advancement due to their unique physicochemical properties which also lead to exhibiting a toxic nature. The toxicology study involves the understanding of dose-response relation, fate and transport of ENMs, and the precise quantification of the dose concentration over time within exposed cells. A novel approach, the ISDD model ((In vivo Suspended Dosimetry in Danio rerio), addresses challenges in the dosimetric response curve by studying live zebrafish larvae as model organisms. Zebrafish larvae are suspended in a micro-well plate to simulate dynamic ENM exposure conditions. This approach sheds light on how the behavior of model organisms affects dosimetric calculations. Also, the ISDD model provides insights into the complex nature of ENM exposure and therefore paves the way to better understand the effect of ENMs and enhanced toxicology studies.

PP21. PRODUCTION OF NUTRACEUTICALS FROM ALGAE

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ABSTRACT

The production of nutraceuticals from algae has gathered interest in recent years due to the rich reserve of bioactive compounds and essential nutrients present within various algae species. This endeavor aims to harness the potential of algae as a sustainable source of health-promoting substances, contributing to both the nutraceutical and functional food industries. The project involves a wholesome approach to cultivating, harvesting, and processing algae to extract bioactive constituents like antioxidants, omega-3 fatty acids, vitamins, and minerals. The project mainly depends on the strain of algae selected and cultivated, growth conditions, centrifugation, filtration, flocculation. Extraction methods involving drying, cell disruption, and solvent extraction are employed to obtain targeted bioactive.

PP22. DYEING FOR A CHANGE: CRAFTING SUSTAINABLE FASHION WITH NATURAL DYEING

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ABSTRACT

This abstract emphasizes a sustainable approach to garment production using natural dyes, with notable benefits for the fashion industry's environmental responsibility. Natural dyes, as opposed to synthetic counterparts, offer advantages in terms of reduced water consumption during production and application, thereby minimizing environmental harm. Additionally,

natural dyes do not contain harmful chemicals that can be detrimental to both wearers and aquatic ecosystem. The Experimental methodology outlined in this paper encompasses practical steps, beginning with the selection of sustainable textile materials such as organic cotton or linen. Subsequently, the sourcing and processing of natural dye materials, including plant extracts and insect-based dyes, are detailed to create dye solutions. Diverse dyeing techniques, such as immersion and tie-dye methods, are employed to infuse these sustainable textiles with vibrant colours. Eco-friendly washing methods further enhance the environmentally conscious approach, while garment construction underscores waste reduction and maximizes the utilization of natural dyes. This paper concludes that the utilization of natural dyes in garment creation represents a sustainable solution for the fashion industry, mitigating reliance on harmful synthetic dyes and conserving precious water resources. This approach closely aligns with the surging consumer demand for eco-conscious fashion. By opting for natural dyes and sustainable textiles, designers and consumers alike contribute to a more responsible and ethical fashion landscape, effectively merging creativity with conscientiousness. Such an approach fosters a more environmentally friendly and ethically driven fashion sector.

PP23. RESPONSE SURFACE METHODOLOGY BASED OPTIMISATION AND PRODUCTION OF AGARASE

Novneet Kour[1], Saganpal Kour[1], Ranjhana Bhatia[1], Hema Setia[1]

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ABSTRACT

The major enzyme involved in the hydrolysis of agar is agarase. Marine source of agarase are being exploited to obtain this valuable enzyme as it has diverse applications like in experimentations and cosmetic industry. Apart from this it demonstrates antioxidant and anti-inflammatory properties. In this study the strain Microbulbifer CMC-5 (MTCC 9889) was studied for production of agarase enzyme and the production parameters of agarase were optimised using response surface methodology (RSM). The factors investigated include pH, temperature, agar concentration and incubation time. The statistical optimization of factors using RSM gave the R2 value of 0.967 which proposed the significance of model. Optimised factors were found to be pH 7, temperature 250C, agar concentration 0.3% and incubation time 36 hrs for the production of agarase. Enzymatic activity was calculated as 661.51 µmole min-1 from the agarase activity assay. Under the optimised condition for agarase production total protein and specific activity was also calculated as 0.982 mg and 673.63 µmole min-1 mg-1 respectively.

PP24. ZEBRAFISH AS MODEL FOR STUDYING HUMAN NEURODEGENERATIVE DISEASES

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ABSTRACT

Neurodegenerative diseases are a group of disorders that cause progressive damage to the brain and nervous system. They are characterized by the deposition of abnormal proteins and the progressive degradation of neurons, thereby affecting the brain and spinal cord. Some of the most common neurodegenerative diseases include Alzheimer's disease, Parkinson's disease, and amyotrophic lateral sclerosis. The slow progression of neurodegenerative diseases makes it difficult to conduct clinical trials that are long enough to demonstrate the efficacy of new treatments. Zebrafish (Danio rerio) have become an important model organism for studying neurodegenerative diseases. Zebrafish can be used to study the neural basis of behaviour and disease because of high genetic similarity with humans and their brains are relatively easy to study. Zebrafish have been used to identify the genes involved in development of diseases, and studying the mechanisms behind the degradation of neurons. Zebrafish has several cerebral nuclei in their brain including the basal ganglia, striatum, hippocampus and amygdala, having remarkable similarity with the mammals. Zebrafish can be used in both in vitro and in vivo drug screening, and numerous new compounds have been verified to be effective against neurodegenerative diseases. Furthermore, transgenic zebrafish models can be used to study human neurodegenerative diseases by exploiting powerful imaging and screening methods to gain new insights into the underlying mechanisms of diseases. The present work discusses the importance of zebrafish as animal models used in study of neurogenerative conditions and their underlying mechanisms behind pathogenesis.

PP25. DEVELOPMENT AND EVALUATION OF PLGA/PHBV BLEND NANOPARTICLES CARRYING PROPOLIS-MEROPENEM

Jaspreet Kaur[1], Shivam Kumar[1], Ashish Kumar Lamiyan[2], Akhil Khajuria[3], Ravi Pratap Barnwal[4], Neelima R Kumar[2], Gurpal Singh[3]

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ABSTRACT

Diverse natural products have been extensively explored in the management of life-threatening diseases. Bee propolis is well-documented for several biological activities, such as antioxidative, antimicrobial, anti-inflammatory, and anti-tumor activities. The latest investigations have identified many potential molecules, igniting in-depth chemical studies to understand the origins of these constituent molecules. There is an urgent need for the development of drug delivery systems to precisely deliver substantial amounts of bioactive molecules to the target site. For medical applications, natural products require improvements in terms of bioavailability. The present work aimed to prepare poly (lactic-co-glycolic acid)

(PLGA) and poly (3-hydroxybutyrate-co-3-hydroxyvalerate) (PHBV) nanoparticles as carriers for meropenem, a carbapenem antibiotic, and propolis, a natural antimicrobial agent with potential adjuvant properties. The study involved the preparation of nanoparticles with meropenem alone, propolis alone, and propolis-meropenem combination groups. PHBV/PLGA blend nanoparticles were prepared via the double emulsion solvent evaporation technique (W1/O/W2) and evaluated for particle size, zeta potential, polydispersity index, and in vitro drug release using the dialysis bag method. The present study aims to establish nanoformulation as a viable delivery system capable of encapsulating natural products alone or in combination with synthetic molecules.

PP26. SCREENING OF BIOLOGICAL EFFECT OF DIOSPYROS KAKI LEAVES, ALOE BARBADENSIS MILLER LEAVES, MORCHELLA ESCULENTA EXTRACTS, ALONE AND IN COMBINATION WITH ANTIBIOTICS AGAINST WILD AND RESISTANT S. AUREUS

Sonal Thakur[1], Nameet Kour[1], Jaspreet Kaur[1]

[1]*UIET, Panjab University, Chandigarh*

ABSTRACT

Antibiotic resistance is the decreased sensitivity of drug, that usually can inhibit the growth of bacteria. Resistance can develop by acquired gene transfer or point mutation of any gene. Staphylococcus aureus is naturally resistant to many antibiotics. This study is aimed at investigating the biological activity of Diospyros Kaki leaves, Aloe barbadensis miller leaves, Morchella esculenta extracts, alone and in combination with antibiotics against wild and resistant strain of S. aureus. The inhibitory effects of antibiotics and plant extracts on S. aureus were evaluated and MIC & IC50 values of drugs were determined using broth microdilution method. Combination of plant extracts and antibiotics were used against the wild and resistant S. aureus and significant inhibition in the growth of organism was observed. Diospyros kaki and Aloe barbadensis were highly effective against the bacteria. Inhibition percentage was 88.9% and 88.6 % respectively whereas Morchella esculenta showed lesser inhibition i.e. 77% as compared to other two extracts. All three extracts when used in combination against sensitive and resistant S. aureus showed significant growth inhibition. A concentration dependent inhibition of growth was observed. Plant extracts and antibiotic in combination was observed with more pronounced result against both strain of S. aureus. The results of the study shows a noticeable difference in the growth inhibition of bacteria which shows the potential of natural plant extracts against S. aureus infections. A potential antibiotic can be obtained with natural plant extracts but more work is needed to investigate its application on medical field.

PP27. PLURI-SUBSTITUTED HYDROXYAPATITE: SYNTHESIS AND CHARACTERIZATION

Sunanda[1], Avneet[1], Seema Kapoor[1], Uma Batra[2]

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ABSTRACT

Bioceramics are materials used to heal and replace damaged components of the musculoskeletal system. They range from inert ceramic oxides to bioresorbable compounds like calcium phosphates (CaP). Among calcium phosphates, hydroxyapatite (HA) is extensively used as a bioresorbable ceramic due to its biocompatibility and similarity to composition of bone and teeth. Hydroxyapatite substituted with ions present in natural bone mineral is gaining attention as even a small amount of substitution can cause a significant change in critical properties such as particle size, morphology, surface area, solubility, etc. In the present study, pluri-substituted hydroxyapatite with ions such as Mg2+, Zn2+ and Ag+ was synthesized using a simple water based sol-gel method. The as-synthesized nanopowder was characterized by X-Ray Fluorescence (XRF) to determine the elemental composition, Field Emission Scanning Electron microscopy/ Energy Dispersive X-Ray (FE-SEM/EDX) to determine the surface morphology & elemental analysis and Thermo gravimetric analysis (TGA/DSC) to study the thermal behavior of nanopowder. Brunauer–Emmett–Teller (BET) using nitrogen adsorption was used to determine surface area, X-ray Diffraction (XRD) analysis to determine phases formed, estimation of crystallinity, crystallite size and lattice parameters i.e. a- axis, c-axis and volume of nanopowders, Fourier Transform Infrared Spectroscopy (FTIR) to determine the presence of functional groups, Transmission electron microscopy (TEM) to study the morphology and particle size of nanopowder. In-vitro study of the as-synthesized nanopowder was conducted by immersing the samples in simulating body fluid at 37°C for 30 days to determine bioactive behavior of the nanopowder.

PP28. ENZYME ASSISTED EXTRACTION OF BETALAINS FROM BEETROOT POMACE (BETA VULGARIS L.) AND ITS CHARACTERIZATION

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ABSTRACT

Beetroot pomace is rich in bioactive components and has potential use in several ways, extraction being one of them. For the extraction of phytochemicals, a few more modern methods, such as ultrasonic assisted extraction, microwave assisted extraction and enzyme assisted extraction, etc., have recently been developed. The enzymatic assisted extraction of red beetroot (Beta vulgaris) pomace betalains, phenolics and total antioxidants were compared with traditional extraction methods. The content of total phenolics in the extracts was determined according to a modification of the Folin-Ciocalteu method and expressed as gallic acid equivalents (GAE). The profiles of extracts were analysed by high-performance liquid

chromatography (HPLC).The studies on plant material with high betalains levels can provide new opportunities for the use of these healthy pigments in the food and pharmaceutical industries.

PP29. SMALL SCALE, BIG IMPACT: DESIGN AND DEVELOPMENT OF FMOC-PHENYLALANINE NANOFIBRILLAR HYDROGEL TO COMBAT ANTIMICROBIAL RESISTANCE

Alisha Lalhall[1], Rohit Sharma[1], Nishima[1]
[1]*Panjab University, Chandigarh*

ABSTRACT

The pursuit of effective antimicrobial agents has spurred significant interest in biomaterials like hydrogels, renowned for their hydration, biocompatibility, stability, and site-specific application benefits. Notably, hydrogels based on Fmoc-protected peptides and amino acids have emerged as particularly promising. These biomaterials can readily gelate through pH modulation, serving diverse biological purposes. This report includes Fmoc-phenylalanine (Fmoc-F)-derived hydrogels, employing trisodium citrate as a pH regulator, and is compared to glucono-δ-lactone, a previously used regulator. The hydrogels are characterized via field emission scanning electron microscopy (FE-SEM), atomic force microscopy (AFM) and FT-IR This study highlights the role of pH modulator and remarkably presents the first-ever evidence of the effectiveness of Fmoc-F-based hydrogels against both Gram-negative and Gram-positive bacteria. This work underscores the potential of Fmoc-F nanofibrillar hydrogels as a strategy to combat antimicrobial resistance.

PP30. EXPERIMENTAL INVESTIGATION OF MINIMUM QUANTITY LUBRICATION (MQL) MACHINING USING BIOFRIENDLY COOLANTS.

Anuj Sharma[1], Rajesh Kumar[1], Jaswinder Singh Mehta[1]
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ABSTRACT

Use of cutting fluids during machining is necessary as it not only removes the heat produced during the shearing of the work piece but also provides lubrication at the chip-tool interface. Flood lubrication is the most commonly used method of cutting fluid application in metal cutting industries where a large continuous stream of cutting fluid at the rate of 10-12 l/min at low pressure is supplied to the cutting zone. Most of cutting fluids when disposed to the environment cause serious environmental problems and human health issues. In this regard dry cutting may seem a viable alternative but it is not found suitable especially for difficult to cut materials like Titanium alloys and Nickel based super alloys. Minimum quantity lubrication (MQL) which is also called near dry machining (NDM) has evolved as a perfect alternative to overcome these challenges. In MQL, a minute amount of cutting fluid (50-100ml/hour) is mixed with high-pressure air and the resulting aerosol is directed to the cutting area through a nozzle that flutters aerosol to the cutting area at high speed. This experimental study investigates the suitability of MQL based cutting environment with different types of

the cutting oils in the machining of biocompatible titanium alloy Ti-6Al-7Nb. The study indicates the benefits of using environment friendly vegetable oils in MQL over the conventionally used mineral oils. Also, Taguchi analysis is used to optimize the considered process factors affecting the surface finish and tool wear during MQL machining.

PP31. A CASE STUDY ON CREATING SUSTAINABLE ART PIECES

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University Institute of Fashion Technology & Vocational Development, Panjab University, Chandigarh

ABSTRACT

Art has long been a powerful medium for self-expression, societal reflection, and cultural exploration. In recent years, the concept of sustainability has gained significant traction, encompassing practices that minimize harm to the environment, promote social equity, and ensure long-term viability. Combining art with sustainability creates a unique and transformative platform, inspiring us to rethink our relationship with the environment while encouraging creative solutions for a better future. The study aims to introduce Sapna Karn whose journey as an eco-artist is nothing short of remarkable. Her unwavering enthusiasm, boundless creativity, and dedication to sustainable practices have paved the way for a unique approach to art and design. The main focus of the study is to determine the process of how this artist breathes new life into discarded objects and materials, transforming them into visually stunning and conceptually rich creations and also determining their advocacy platforms where they encourage society to reevaluate our throwaway culture and embrace a more sustainable approach to consumption.

PP32. ELECTROCHROMIC AND ELECTROCHEMICAL PERFORMANCE STUDY OF $MOSE_2/WO_3$ NANOCOMPOSITE

Rahul Sharma[1], Nihal[1], Mamta Sharma[1], J.K. Goswamy[1]

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ABSTRACT

This study investigates the use of molybdenum diselenide ($MoSe_2$) and tungsten trioxide (WO_3) nanocomposites as electrode materials for electrochromic devices. The nanocomposite was prepared by exfoliating $MoSe_2$ in WO_3, and XRD spectra showed agglomeration due to $MoSe_2$ grain boundaries. FESEM and HRTEM were used to study the morphology of the nanocomposites. The distribution of nanoparticles was more uniform than WO_3, and the shape of WO_3 changed from irregular sheet to square nanosheets with good dispersion. The electrochemical performance was investigated by charge/discharge, chronoamperometry, and cyclic voltammetry, and faster charge transfer kinetics were observed. UV/Vis spectroscopy was used to study the electrochromic and optical properties of the fabricated ECDs. Overall, the study shows that $MoSe_2/WO_3$-based ECDs provide better electrochromic performance compared to WO_3 ECDs.

PP33. EFFECT OF PRETREATMENT ON DE-OILED SUNFLOWER CAKE AND ITS EFFECT ON EXTRACTED PROTEINS

Ramanpreet Kaur[1], Gargi Ghoshal[1], Sanchita Chauhan[1]

[1]Dr. SSB. UICET, Panjab University, Chandigarh

ABSTRACT

The present work was aimed to check the effect of two different solvents on defatting and removal of polyphenols from de-oiled sunflower cake. The effect of both the solvents on protein was checked by investigating their structural, functional, and rheological properties of protein. The proteins obtained by using two-step process i.e., defatting and removal of polyphenols is called SPH, and which is obtained in single step is called SPM. There was no significant difference found in structural, functional, and rheological properties of protein. Among functional properties, WBC, OBC, emulsification properties, foaming properties and solubility, there was no considerable difference. SPH and SPM proteins showed good gelation properties. Both proteins exhibited good gel strength and had more elastic behavior. Overall, there was no major difference in either of the proteins. Thus, it was concluded that instead of using two steps for defatting and removal of polyphenols, a single step can be used for the extraction of protein from sunflower meal, thereby making the process easy.

PP34. PHOTOCATALYTIC HYDROGEN PRODUCTION BY WATER SPLITTING USING VARIOUS PHOTOCATALYSTS - A REVIEW

Shreya Goswami[1], Amrit Pal Toor[2]

[1]Dr. S.S. B University Institute of Chemical Engineering and Technology, Panjab University, Chandigarh, 160014, India, [2]Dr. S.S. B University Institute of Chemical Engineering and Technology, Panjab University, Chandigarh, 160014, India and Energy Research Centre, Panjab University, Chandigarh, 160014, India

ABSTRACT

Hydrogen is a clean source of energy for many reasons such as renewability, environmental friendliness, and economic effectiveness. Hydrogen is regarded as a perfect fuel and is highly preferred. The quick advancement of modern society is mainly reliant on fossil fuels. Massive fossil fuel consumption has led to an intensifying energy problem and environmental concerns. In order to address this issue, experts and a wide range of environmental activists are now focusing more on renewable energy. The highest possible use of solar energy has generated a lot of interest in photocatalytic hydrogen generation using semiconductor materials as catalysts. Semiconductor materials absorb photons with energy hυ equal to or greater than the semiconductor's band gap, and this results in photocatalytic reactions. An electron-hole pair is produced when electrons move from the valence band to the conduction band as a result of absorbing this energy. After entering the conduction band, these photogenerated electrons reduce H+ into H2, while holes on the semiconductor surface break down H2O into O2 and H+. The performance of various catalyst was reviewed for the photocatalytic hydrogen production by water splitting method. To optimize the photocatalysts for hydrogen production, this review will provide a fundamental understanding to novices and in-depth knowledge to specialists in the field.

PP35. PHOTOELECTROCHEMICAL BEHAVIOUR OF MOSE2 DECORATED FE2O3 PHOTOELECTRODE FOR MULTIFUNCTIONAL WASTEWATER TREATMENT AND HYDROGEN GENERATION

Pooja Singh[1], Pooja Devi[2]

[1]*Academy of Scientific and Innovative Research (AcSIR), Ghaziabad- 201002, India*

[2]*Materials Science and Sensor Application, Central Scientific Instruments Organisation, Chandigarh-160030*

ABSTRACT

To address the growing global energy demand, the world is transitioning to renewable sources, with hydrogen emerging as a clean and sustainable fuel option. While water is abundant, but availability of fresh water is very limited, and alternatively untreated wastewater can also be a source of pollution. Thus, using polluted/low quality water for hydrogen production presents a dual solution: managing wastewater while generating clean fuel. Photoelectrochemical (PEC) water splitting using photoelectrodes offers a promising approach. In this study, we showcase hydrogen production from dye-contaminated water (utilizing methylene blue as a model pollutant) using a $MoSe_2$-decorated Fe_2O_3 photoelectrode in a PEC water-splitting system. Characterization confirms improved optical and structural properties. The hybrid electrode achieves a maximum photocurrent density of approximately 2.2 mA/cm² at 1.23 V vs RHE. Optimized conditions yield impressive dye degradation efficiency (~97.58%), significantly surpassing $MoSe_2$ and Fe_2O_3 alone. The electrodes were also studied for real waste water, which resulted in 53.84% removal of TOC and 67.37% removal of COD along with H_2 generation. This could be assigned to efficient charge separation in the designed heterostructure. Scavenger tests elucidate degradation mechanisms, highlighting hole-driven dye degradation and electron-mediated hydrogen production.

Life Sciences

- Botany
- Zoology
- Anthropology
- Forensic Science

CO-ORDINATORS

Prof. Kamaljit Singh

Dr. Mani Chopra

CHASCON 2023
National Conference on
Global Science for Global Wellbeing

SECTIONAL PROGRAM (OCTOBER 13, 2023)
LIFE SCIENCES
Venue: Department of Zoology, Panjab University, Chandigarh

Sectional President Prof. Kamaljit Singh 9815106644	**Sectional Secretary** Dr. Mani Chopra 9914133434
Time	**Program**
9:00 – 9:45	Display of posters by participants **Venue:** Ground Floor Corridor of the Department of Zoology
9:45 – 10:00	Inauguration of Sectional Program **Venue:** G.P. Sharma Auditorium, Department of Zoology
Session Chair: Professor Sukhbir Kaur	
10:00 – 10:45	**Session Chair:** Professor Sukhbir Kaur **Speaker:** Prof. (Dr.) Amod Gupta Emeritus Professor Advanced Eye Centre, PGIMER, Chandigarh ***"Communicating Science – the Steps Before"***
10:45 – 11:30	**Session Chair:** Professor Promila Pathak **Speaker:** Dr. Vaneet Jishtu Scientist -E Himalayan Forest Research Institute, Shimla, Himachal Pradesh ***"Plant Diversity from the Trans Himalayan Cold Deserts of Ladakh"***
11:30 – 12:00	**Tea break**
12:00 – 13:00	Oral Presentations (Faculty) **Venue:** G.P. Sharma Auditorium, Department of Zoology Poster Presentations (UG/PG) **Venue:** Ground Floor Corridor of Department of Zoology
13:00 – 14:00	**Lunch**
14:00 – 17:00	Oral presentations (UG/PG and Research Scholars) **Venues:** 1. G.P. Sharma Auditorium, Department of Zoology 2. Seminar Room, Department of Zoology 3. Seminar Room, Department of Anthropology Poster Presentations (Research Scholars and Faculty) **Venue:** Ground Floor Corridor of Department of Zoology **Tea break from 3:30 to 4:00**

ABSTRACTS OF ORAL PRESENTATIONS

PARTICIPANTS

S. No.	Name of participant	Affiliating institution	Title of abstract
1.	Jagdish Rai	Institute of Forensic Science and Criminology Panjab University, Chandigarh	Potential applications of foldscope in forensics
2.	Jeesu Jaskanwar Singh	Department of Education, CDOE, Panjab University, Chandigarh	Impact of garbage on wildlife and creating awareness about garbage management and disposal through building as learning aid (BALA) in Chandigarh .
3.	Ranjana Jaiswara	Department of Zoology, Panjab University, Chandigarh	Crickets and the significance of bioacoustics
4.	Seema Kirar	Center of innovative and applied bioprocessing CIAB Mohali Punjab India	Lignin copper oxide nanocomposite films: A UV shielding biomaterials for biomedical applications
5.	Akanksha Sharma	Institute of Forensic Science and Criminology, Panjab University, Chandigarh	Forensic analysis of cigarette leftovers using non-destructive ATR-FTIR spectroscopy and chemometric modalities
6.	Amandeep Kaur	Department of Botany, Panjab University, Chandigarh	Molecular characterization of mechanosensitive channels in bread wheat
7.	Ankita Guleria	Department of Anthropology, Panjab University, Chandigarh	Metric and morphological assessment of face: Forensic and anthropological aspect
8.	Anshul	Department of Botany, Panjab University, Chandigarh	Antifungal activity of Marchantia polymorpha L.
9.	Anupika Sood	Department of Zoology Panjab University Chandigarh	Molecular evolution of intraspecific populations of Culex quinquefasciatus (Diptera: Culicidae) from Chandigarh and its adjoining areas
10.	Aruna Yadav	Department of Zoology, Kurukshetra University, Kurukshetra	Diversity and monitoring of Avifauna of Mandothi wetlands, Haryana, India

11.	Bristy Kalita	Department of Anthropology, Panjab University	Driving the future: A comparative analysis of the driving force of electric vehicles in London and Delhi
12.	Charu Sharma	Department of Botany, Panjab University, Chandigarh	Biotechnological interventions for conservation and secondary metabolites production in medicinally important Saussurea spp.
13.	Deepak Nain	Department of Zoology, Panjab University, Chandigarh	A new species of Strepsipteran parasite Xenos ragahavendri infects the indian population of Eusocial wasp Polistes wattii
14.	Gulshan	Institute of Forensic Science and Crimonology, Panjab University, Chandigarh	Forensic speaker and gender identification from voice samples recorded through mobile phones and social media applications: A statistical and machine learning approach
15.	Gurleen Kaur Sodhi	Department of Biotechnology, Thapar Institute of Engineering and Technology, Patiala	Plant growth-promoting endophyte from drought resistant rice mitigates abiotic stress in rain-fed rice variety
16.	Himanshu	Departments of Endocrinology, Post Graduate Institute of Medical Education and Research, Chandigarh	Effect of calcifediol supplementation (Vitamin D) as add-on therapy on the gene expression profile in recipients of the ChAdOx1 nCoV-19 vaccine
17.	Komal Choudhary	Department of Botany, Panjab University, Chandigarh	Taxonomic characterization of some morphologically similar species of genus Bauhinia plum. Ex L.
18.	Manisha Pandey	Department of Botany, D.A.V. (P.G) College, Dehradun, Uttarakhand-248001	Regeneration status and phytosociological study of Raipur forest range, Garhwal Himalaya
19.	Meenu Patil	Soil Ecosystem and Restoration Ecology Lab, Department of Botany, Panjab University, Chandigarh	Mycorrhizal fungi accelerate litter decomposition rates in forest ecosystems

20.	Mehak Preet Kaur Nagi	Department of Anthropology, Panjab University, Chandigarh	Psychological trauma & polycystic ovary syndrome: An anthropological investigation
21.	Nandini Chitara	Department of Anthropology, Panjab University, Chnadigarh	Tattoo marks in generating biological profile: Implications in human identification
22.	Neelam Gautam	Department of Botany, Panjab University, Chandigarh	Challenges in taxonomic characterization of plants with special reference to some species of genus Euphorbia
23.	Nitin Kumar	Department of Human Genetics, Punjabi University, Patiala	Inflammasome signaling is genetically regulated for influencing the risk of ischemic stroke
24.	Nupur Munjal	Plaksha University, Punjab	Cytokine-receptor interactions: Thermodynamic insights and predictive modeling
25.	Ranjana Rani	Department of Zoology, DAV College, CHD	A comprehensive checklist of mosquitoes (Diptera: Culicidae) of Chandigarh and its surrounding areas and their ecological and epidemiological significance
26.	Sachin Sharma	Department of Botany, D.A.V. (P.G) College, Dehradun, Uttarakhand-248001	A study of the biological spectrum, phenology, and diversity of ruderals and agrestals weeds in Moradabad district
27.	Sakshi Garg	Department of Anthropology, Panjab University, Chandigarh	Ailments under the Unani lens: Investigating treated conditions at the dispensary
28.	Shivani Sehgal	Amity institute of Forensic Science, Amity University, Uttar pradesh-201313, India	Fabrication of novel polymeric microchip for on-site extraction of human genomic DNA and its comparison with FTA® paper
29.	Shriya Kalia	Department of Anthropology, Panjab University, Chandigarh	Exploring the enigmatic history of Chintpurni temple of District Una, Himachal Pradesh
30.	Shruti Nagrath	Department of Microbial Biotechnology, Panjab University, Chandigarh	Exploring anti-cancer potential of biosurfactant from endophytic bacteria on human acute T cell leukemia cells (Jurkat, Clone E6-1)

31.	Simran Bhatia	Center of Innovative and Applied Bioprocessing, Mohali, Punjab	Insights into kinetic characterization of novel thermostable lytic polysaccharide monooxygenase for bio-catalytic degradation of lignin derived β-O-4 compounds: Paving way for lignin valorisation
32.	Sunita	Orchid Laboratory, Department of Botany, Panjab University, Chandigarh- 160 014, U.T., India	Asymbiotic seed germination of a threatened and medicinally important indian orchid, Cymbidium aloifolium (L.) Sw.
33.	Swati	Centre for Nuclear Medicine (UIEAST), Panjab University Chandigarh, India,	Exosome mediated non-targeted effects of 177LU-DOTATATE therapy in neuroendocrine tumor
34.	Tanvi Sharma	Department of Biophysics, Panjab University, Chandigarh 160014, India	Harnessing gut microbiota-derived short-chain fatty acids for attenuating high-fat diet-induced metabolic syndrome: Insights and therapeutic prospects
35.	Urvashi	Department of Psychology, Panjab University, Chandigarh	Exploring road rage dynamics in India: Analyzing age, mindfulness, and spatial anxiety effects on female drivers
36.	Annanya Mahajan	Department of Zoology, Panjab University, Chandigarh	Heart–on–a–chip: Disease modeling and drug development
37.	Jashandeep Singh Brar	GGDSD College, Chandigarh, India	Therapeutic manipulation of patient haematopoietic stem cells via ex vivo prime editing strategy for the treatment of sickle cell disease
38.	Kavita	Department of Zoology, Punjab Agricultural University, Ludhiana	Antifertility effect of andrographolide based bait in male house rat, Rattus rattus
39.	Komalpreet Kaur	Department of Zoology, Punjab Agricultural University, Ludhiana	An innovative neem seed extract and andrographolide based bait with toxic and antifertility effects for the management of rodent pests

40.	Shivnam Rana	Punjab Agricultural University	Thiamethoxam degradation by Salmonella enterica strains isolated from agricultural soils
41.	Sysha Handa	Department of Biochemistry, Punjab Agricultural University, Ludhiana	Solanum insanum – S. Melongena introgression lines susceptible to eggplant jassid suffered high oxidative stress with increased phenolic elements
42.	Tamanna	Department of Zoology, Panjab University, Chandigarh	Genome editing: The next generation of medicines

OP1. POTENTIAL APPLICATIONS OF FOLDSCOPE IN FORENSICS

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ABSTRACT

Recently there have been many portable microscopes devised for application in citizen science and on site diagnostics in remote areas. Foldscope is one such portable microscope with 140x magnification and lowest cost so far. It can be very useful in forensics for microscopic observations during crime site investigations. Traditionally, a magnifying glass is used for searching trace evidences at crime site. Foldscope attached to a mobile camera is equally portable and cost-effective but with more magnification power and other functionalities like florescence microscopy, bright-field microscopy, dark-field microscopy, polarized light microscopy etc. We have shown that foldscope can be used to search microscopic evidences by attaching only foldscope lens to a mobile phone camera and keeping the phone at around 10-degree angle from the surface so that light reflected from the sample enters the lens. We observed pollen grains on surfaces relevant to crime scene investigation such as cotton cloth, skin, woolen cloth, denim jeans etc., which was clear enough to match it with reference sample or identify its plant species. Furthermore, we have also preliminarily explored its application in observing pigmentation pattern of human hair, tool marks on immovable surfaces, micro-printing on currency notes, diatoms, soil etc. In conclusion, foldscope has potential be a useful tool that can be included in mobile forensic lab and in forensic tool kit for crime scene investigation.

OP2. IMPACT OF GARBAGE ON WILDLIFE AND CREATING AWARENESS ABOUT GARBAGE MANAGEMENT AND DISPOSAL THROUGH BUILDING AS LEARNING AID (BALA) IN CHANDIGARH.

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ABSTRACT

Chandigarh is a green city with a forest area of 22.8 square km. The population of Chandigarh has touched 12,50,353 lakhs. The rising population is aggravating the problem of garbage disposal and management. The city generates around 550 metric tonnes (MT) of garbage daily, of which around 374 MT is wet waste while the remaining is dry, including horticulture and sanitary waste. Garbage poses a substantial risk to wildlife and has numerous negative impacts on ecosystems and animal populations. Wildlife often mistake garbage for food, leading to the ingestion of plastic, metal, and other non-biodegradable materials. The dumping of garbage in natural habitats disrupts ecosystems and leads to habitat degradation. Many discarded items contain toxic chemicals that can leach into the environment, contaminating soil, water, and food sources for wildlife. Garbage also serves as a breeding ground for disease vectors such as rats and mosquitoes. These vectors can transmit diseases to both wildlife and humans, creating a health hazard for all species in the affected area. Some wildlife species may alter their behavior to scavenge in garbage dumps or landfills, which can lead to increased human-

wildlife conflicts. Animals that become accustomed to human food sources may lose their natural foraging skills and become dependent on unhealthy diets. The Building as Learning Aid (BaLA) is a grassroots-level innovation implemented in Government Schools of Chandigarh. BaLA is being used to raise awareness and motivate young minds for responsible waste management and protecting the environment.

OP3. CRICKETS AND THE SIGNIFICANCE OF BIOACOUSTICS

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ABSTRACT

Orthopterans are primarily recognized for their ability to produce acoustic signals and for their robust hind limbs that facilitate extensive jumping abilities. The process of sound production entails the frictional interaction between different body parts, such as wings, legs, or abdomen. Crickets and katydids generate acoustic signals by the mechanism of wing stridulation, wherein modified wing structures are rubbed together. In contrast, grasshoppers produce sound by rubbing their hind femur against a specific region of the wing. When considering the communication of animals that rely on sound, acoustic signals are of utmost importance in facilitating communication between individuals of the same species and in promoting reproductive isolation between different species prior to mating. Crickets have been extensively researched as organisms that engage in acoustic signaling. Male crickets make species-specific acoustic signals, known as calling songs, to attract females from afar. These signals are generated by a stridulatory mechanism located on their forewings. Female individuals exhibit a behavior of remaining silent and afterward responding by acknowledging and approaching the calling male of their own species. This behavior of females is called phonotaxis. The species-specific nature of acoustic signals makes them a dependable means for detecting and characterizing cryptic species, as well as for conducting extensive acoustic monitoring to assess species richness within a certain geographic region. The present study revolves around the utilization of acoustic signals emitted by Orthoptera for the purposes of taxonomic identification, comprehension of behavior, and demarcation of species boundaries within cryptic species.

OP4. LIGNIN COPPER OXIDE NANOCOMPOSITE FILMS: A UV SHIELDING BIOMATERIALS FOR BIOMEDICAL APPLICATIONS

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ABSTRACT

Lignin, a renewable aromatic biopolymer, holds significant potential for applications in bio-refineries, biofuels, thermoplastics, and eco-friendly nanofilms. Transforming lignin-based biomass into biodegradable nanofilms is vital. India's nanofilm exports are limited, largely relying on costly imported nanomaterials. Utilizing the alkaline extraction method, yields high lignin output with lower chemical and energy input, suitable for large-scale production. Converting lignin to nano size and utilizing it as, self-cleaning and UV protective nanofilms,

enhances properties from mechanical strength to antibacterial and antioxidant functions. Lignin-doped polyvinyl alcohol/polyethylene glycol nanocomposites exhibit increased flexibility and strength. Lignin nanofilms showcase water resistance and self-cleaning under light, paralleling commercial counterparts, suggesting potential for eco-friendly coatings and insulation. These nanofilms unite cost-effectiveness, agri-waste sourced lignin, and multi-functionality. Lignin-derived nanoparticles are synthesized from agricultural waste, bypassing harmful chemicals, yielding affordable nanofilms. The innovation simultaneously repurposes agricultural waste into lignin-based, multi-functional nanofilms, offering waterproofing, self-cleaning, and cost efficiency in a single sustainable product.

OP5. FORENSIC ANALYSIS OF CIGARETTE LEFTOVERS USING NON-DESTRUCTIVE ATR-FTIR SPECTROSCOPY AND CHEMOMETRIC MODALITIES

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ABSTRACT

Cigarette leftovers (ash and filter) are frequently found in a variety of crime scenes involving murder, suicide, rape, dacoity, or assault cases; however, they are overlooked as potential evidence by investigators. This research aims to assist an investigator in figuring out the number of people who were there at the time of the crime as well as narrowing down the suspect pool. Cigarette ash can resemble any other type of ash (burnt paper, cloth, tandoor, etc.); similarly, a cigarette filter can resemble a range of filter fibers (of a natural, semi-synthetic, or synthetic nature). When the origin is narrowed down, the analysis can also be performed for brand discrimination. For this research, the collected cigarette ash and filter fiber samples were examined using ATR-FTIR spectroscopy in tandem with two chemometric models: unsupervised PCA and supervised PLS-DA. Differences in peak patterns and the presence or absence of specific components in the fingerprint region were investigated for discriminatory purposes. However, as spectral evaluation is time-consuming and prone to human error, the data was pre-processed and further analyzed using chemometrics to improve sample discrimination. When the proposed method was employed, outstanding results were obtained for both kinds of samples. As a result, this study offers a novel, non-destructive method of assessing cigarette leftovers. A repository of this type of evidence is produced in the mid-IR range due to the lack of a similar library or database, which might be useful in a criminal investigation to pin down a suspect pool.

OP6. MOLECULAR CHARACTERIZATION OF MECHANOSENSITIVE CHANNELS IN BREAD WHEAT

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ABSTRACT

All the organisms including prokaryotes and eukaryotes perceive and respond to various mechanical signals for proper growth and development and, stress tolerance. However, the

various intracellular or extracellular signals cause plasma membrane distortion, resulting in the activation of several ion channels. These channels are pore-forming transmembrane proteins are referred to as mechanosensitive (MS) ion channels or stretch-activated channels. The plant MS ion channels were grouped into five families such as Mechanosensitive channel of small conductance-like (MscS-like or MSL), Mid1-complementing activity (MCA), two-pore potassium (TPK), Piezo channel, Reduced hyperosmolality-induced [Ca2+] increase (OSCA). In *Triticum aestivum*, 30 MSL, 11 TPK, 3 Piezo and 42 OSCA genes were identified. Chromosomal localization suggested the location of these genes on several chromosomes of A, B and D sub-genome. Phylogenetic, gene and protein structure analysis indicated the conserved nature of above identified channels of *T. aestivum*. Expression analysis of TaMSL, TaTPK, TaPiezo and TaOSCA genes revealed the role of these channels in three tissue developmental of five organs such as root, stem, spike, grain and leaf. Differential expression of TaMSL, TaTPK, TaPiezo and TaOSCA genes indicated their role in abiotic (heat, drought and combined heat drought) and biotic (*Puccinia striiformis* f. sp. *tritici* and *Blumeria graminis* f. sp. *tritici*) stress tolerance. The qRT-PCR analysis suggested the involvement of TaMSL, TaPiezo and TaOSCA genes in Ca2+-homeostasis and signalling. The current study could provide a foundation for the functional characterization of potential genes in future studies and their involvement in crop improvement.

OP7. METRIC AND MORPHOLOGICAL ASSESSMENT OF FACE: FORENSIC AND ANTHROPOLOGICAL ASPECT

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ABSTRACT

Personal identification of individuals is very important in forensic science. It is a well-known fact that no two individuals are exactly alike in their measurable characteristics and features. People usually identify each other based on their facial characteristics in everyday life. Human face is a topic of interest among the various disciplines such as anatomy, anthropology, forensic science, surgery etc. In the modern context, facial analysis involves the study of faces for forensic purposes using different techniques such as studying the morphology and dimensions of the face. Therefore, the main objective of the present study was to analyze the facial features of a Rajput population of Mandi district, Himachal Pradesh. The study incorporated 228 (158 males and 70 females) healthy, young and adult subjects of the 18-35 years age group with no facial abnormalities. Nineteen measurements were taken on the face of each subject and facial indices were calculated. The morphological analysis was done directly from the photographs of subjects captured in the norma frontalis and norma lateralis positions. The dominant and rare facial features of the population were analyzed. The findings of this study will be helpful for forensic purposes in personal identification and facial reconstruction of biological profiles and disputed identification as well as for surgeons in plastic surgery.

OP8. ANTIFUNGAL ACTIVITY OF MARCHANTIA POLYMORPHA L.

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ABSTRACT

The aim of the current work is to find a dependable and eco-friendly microorganism biocontrol technique. The antifungal activity of *Marchantia polymorpha* was determined using Food Poison Technique. To evaluate total phenolic and total flavonoid content, quantitative analysis was performed, as well as FTIR and GC-MS analysis to determine the active phytocompounds present in the plant extract. The mode of antifungal action of the extract was investigated using scanning electron microscopy to examine the effect on the morphology of Fungal hyphae, as well as fluorescence microscopy to examine cell membrane permeability and the production of Reactive Oxygen Species (ROS) in treated hyphae. The findings showed that three fungi, *Fusarium oxysporum*, *Rhizoctonia solan*i and *Alternaria alternata* were sensitive to the extracts of *Marchantia polymorpha*. Phytochemical analysis revealed high phenolic as well as flavonoid content, and GC-MS analysis revealed the presence of some active phytocompounds with antimicrobial, anticancer, and antioxidant properties such as 13-Docosenoic acid, methyl ester, n-Hexadecanoic acid, Stigmasterol, and phytol. The SEM results clearly demonstrated the damage caused to the fungal hyphae and production of ROS in response to extract. Hence *M. polymorpha* extracts show the potential as a promising biocontrol agent against fungal diseases, providing a safer and more environmentally friendly alternative to synthetic chemicals that is beneficial to both human health and the environment.

OP9. MOLECULAR EVOLUTION OF INTRASPECIFIC POPULATIONS OF CULEX QUINQUEFASCIATUS (DIPTERA: CULICIDAE) FROM CHANDIGARH AND ITS ADJOINING AREAS

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ABSTRACT

The southern house mosquito, *Culex (Culex) quinquefasciatus*, is very common in the tropics, subtropics, and temperate zones throughout the world. It is associated in the spread of a wide range of mosquito-borne illnesses like Zika, West Nile fever, Western equine encephalitis, St. Louis encephalitis, and filariasis. During present investigation, a total of 4425 mosquitoes belonging to *Cx. quinquefasciatus* have been collected from various ecologically distinct habitats of Chandigarh and its surroundings during four-years study period. Thirteen different intraspecific populations (morphological variants) of *Cx. quinquefasciatus* based on the analysis of phallosome of male genitalia have been observed. These variants were further subjected to molecular characterization using mitochondrial marker COI. The DNA sequences of studied thirteen different *Culex quinquefasciatus* variants have been compared with the already present *Culex quinquefasciatus* sequences in the NCBI databases to determine novelty of the sequences. The current investigations have revealed that these variants are genetically

diverse members of a monophyletic taxon. It positively marks small genetic changes in the nucleotide composition to distinguish close similarity in the populations of *Cx. quinquefasciatus* which is ultimately very important to control various vector-borne diseases. Hence, the genetic divergence, transversion distance along with phylogenetic relatedness through mitochondrial regions are useful supplements to identify species specific status.

OP10. DIVERSITY AND MONITORING OF AVIFAUNA OF MANDOTHI WETLANDS, HARYANA, INDIA

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ABSTRACT

The Mandothi Wetlands serve as a crucial habitat for numerous species of resident and migratory fauna. It is comprised of about 1000 acres of private farmland in Bahadurgarh tehsil of Jhajjar district of Haryana State, India. This study aimed to assess the diversity, abundance, and seasonal patterns of migratory bird species, as well as their ecological interactions within the wetland ecosystem. In the selected study area, 148 species of birds from 104 genera, 44 families, and 16 orders were recognized over the course of the study period from December 2021 to March 2023 with the help of point count and vehicle-based count over selected transects. Among the surveyed species, order Passeriformes was the most dominated taxa with 49 species of total reported avifaunal species. Feeding guild analysis expressed that Insectivore were the dominant ones. As per the IUCN Red List criteria, 136 bird species were classified as least concern (LC), whereas 7 bird species as Near Threatened (NT), and 4 species as Vulnerable (VU). The RDi of families was recorded highest for Anatidae (10.71). Out of recorded 148 species, 80 species were Resident; 52 Winter migrants and 16 Summer migrants. As the study area holds a significant role in maintaining the diversity of birds thus it needs to be conserved.

OP11. DRIVING THE FUTURE: A COMPARATIVE ANALYSIS OF THE DRIVING FORCE OF ELECTRIC VEHICLES IN LONDON AND DELHI

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ABSTRACT

This comprehensive analysis compares the perception of electric vehicles (EVs) in Delhi and London, highlighting divergences and convergences in their acceptance. Environmental awareness, infrastructure, government initiatives, socio-economic conditions, cultural values, and market dynamics shape these perceptions. Delhi's focus on combatting pollution and emissions contrasts with London's multifaceted considerations: size, performance, and cost. Infrastructure readiness, socio-economic factors, and cultural values also contribute to distinct views. While London boasts an advanced charging network, Delhi faces challenges due to a lack thereof. The study underscores the importance of renewable energy sources and offers

insights for policymakers, urban planners, and industry stakeholders. Overall, this research unveils the intricate interplay of factors influencing EV perception, which is crucial for global sustainable transportation transitions.

OP12. BIOTECHNOLOGICAL INTERVENTIONS FOR CONSERVATION AND SECONDARY METABOLITES PRODUCTION IN MEDICINALLY IMPORTANT SAUSSUREA SPP.

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ABSTRACT

Saussurea DC. is a well-recognized genus for its commercially important secondary metabolites with its maximum diversity in the Himalayas and East Asia. The rising demand for versatile metabolites (costunolide, syringin, hispidulin, jaceosidin, rutin) poses a threat to the natural habitat of *Saussurea* spp. As a result, plant cell and tissue culture technology have attained cutting-edge progress for its conservation and secondary metabolites production. Various protocols of in vitro micropropagation, cell culture, somatic embryogenesis, and cryopreservation have been studied extensively for the conservation and specialized metabolite production in the genus *Saussurea*. Furthermore, to enhance in vitro biosynthesis of these metabolites, the application of elicitors has played a significant role. The evolution of protocols that have been achieved during the past years for the augmentation of secondary metabolites is envisaged to design species-specific elicitation strategies in this genus. Molecular cues unpinning the genes involved in secondary metabolite biosynthesis have also been studied in this genus. Up-to-date information on biotechnological prospects such as plant, cell, tissue, and organ culture, cryopreservation, and secondary metabolites production in *Saussurea* spp. is discussed.

OP13. A NEW SPECIES OF STREPSIPTERAN PARASITE XENOS RAGAHAVENDRI INFECTS THE INDIAN POPULATION OF EUSOCIAL WASP POLISTES WATTII

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ABSTRACT

Strepsipterans are a fascinating group of parasitic insects that infect a wide range of insects and exhibit complex life cycles involving remarkable adaptations for their parasitic lifestyle. The genus *Xenos* within the order Strepsiptera comprises diverse species, each displaying various host-parasite interactions. Xenos infection causes morpho-physiological and behavioural changes in their eusocial insect hosts. Different aspects of the endoparasitic association of European paper wasp *Polistes dominula* infected by *Xenos vesparum* have been studied. However, this association has not been studied in any eusocial insect from India. Here, we present the morphological description, phylogenetic position, and behavioural description

of a new species of *Xenos*, *X. raghavendri*, which parasitizes the Indian population of *P. wattii*. This study will enhance our understanding of the intricate relationships existing between strepsipteran parasites and their eusocial hosts.

OP14. FORENSIC SPEAKER AND GENDER IDENTIFICATION FROM VOICE SAMPLES RECORDED THROUGH MOBILE PHONES AND SOCIAL MEDIA APPLICATIONS: A STATISTICAL AND MACHINE LEARNING APPROACH

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ABSTRACT

A recent forensic speaker comparison (FSC) study investigated formant characteristics in sustained monophthong vowels produced by 40 young English speakers (20 males, 20 females) via mobile phones and social media platforms. Formants F1 and F2 were found to reliably identify vowels /a/, /e/, and /u/ in males, achieving accuracy rates of 100% to 75%. For vowels /i/ and /o/, Formants F1 and F3 displayed accuracy levels of 100% to 50% in males. Among females, Formants F1 and F3 were consistent markers for vowels /i/, /o/, and /u/, with accuracy ranging from 100% to 50%. For vowels /a/, /e/, and /u/, Formants F1 and F2 showed accuracy from 100% to 75%, suitable for personal identification. Predictor significance was assessed using F-test for formant distribution. In males, F1 and F2 showed higher significance (75%), while in females, F4 had greater significance (75%) for vowel /a/. Vowel space was constructed using mean formant frequency values, showing variance differences between male and female speakers. Machine learning techniques including LDA, SVM, KNN, Random Forest, and CART were employed for gender classification, with Random Forest being most effective. Notably, Random Forest consistently achieved higher accuracy rates (88% to 93%) and AUC values (0.92 to 0.96), despite formant frequency variations across algorithms. The study underscores the potential of formant characteristics and machine learning for forensic speaker analysis.

OP15. PLANT GROWTH-PROMOTING ENDOPHYTE FROM DROUGHT RESISTANT RICE MITIGATES ABIOTIC STRESS IN RAIN-FED RICE VARIETY

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ABSTRACT

Climate change has severely impacted crop productivity. Nascent technologies, such as employing endophytic fungi to induce crop adaptogenic changes, are being explored. In this study, 62 isolates of fungi existing as endophytes were recovered from different parts of a drought-resistant rice variety and screened for salinity and drought tolerance. *Nigrospora oryzae* #2OSTUR9a exhibited in vitro antioxidant potential, indole acetic acid (351.01 ± 7.11 µg/mL), phosphate solubilisation (PI 1.115 ± 0.02), siderophore (72.57% ± 0.19%) and 1-

aminocyclopropane-1-carboxylate deaminase production (305.36 ± 0.80 nmol α-ketobutyrate/mg/h). To the best of our knowledge, this is the first report on salinity and drought stress mitigation in rice plants by endophytic *N. oryzae*. In treated plants under salinity stress, the relative water, chlorophyll, phenolic and osmolyte content increased by 48.39%, 30.94%, 25.32% and 43.67%, respectively, compared with their respective controls. A similar trend was observed under drought stress, where the above parameters increased by 50.31%, 39.47%, 32.95% and 50.42%, respectively. Additionally, the antioxidant status of the treated plants was much higher because of the enhanced antioxidant enzymes and reduced lipid peroxidation. Our findings indicate the ability of *N. oryzae* to effectively mitigate the impact of stress, thereby enabling the rice plant to sustain stress conditions.

OP16. EFFECT OF CALCIFEDIOL SUPPLEMENTATION (VITAMIN D) AS ADD-ON THERAPY ON THE GENE EXPRESSION PROFILE IN RECIPIENTS OF THE CHADOX1 NCOV-19 VACCINE

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ABSTRACT

The ChAdOx1 nCoV-19 (COVISHIELD) vaccine has emerged as a pivotal tool in the global fight against the COVID-19 pandemic. To enhance the immunogenicity of the vaccine, some recipients have received supplementation with calcifediol, a direct precursor to the biologically active form of vitamin D. In this study, we investigated the effects of calcifediol supplementation on gene expression profiles in individuals who received the COVISHIELD vaccine for over six months. Peripheral blood samples were collected from vaccine recipients with and without calcifediol supplementation, and gene expression profiles were analyzed using high-throughput sequencing techniques and complex computation analysis. The clinical parameters examined in our study not only shed light on the dynamics between calcifediol, PTH, calcitriol, and calcium concentrations but also emphasize the role of vitamin D as a clinical adjunct. Our results reveal distinct patterns of gene expression associated with calcifediol supplementation, An optimally concentration of calcifediol has the potential to establish a microenvironment that facilitates the initiation of T cell activation, robust cytokine signaling, heightened innate immune responses and downregulation of coronavirus disease. Overall, our study's comprehensive analysis of calcifediol supplementation, gene expression, and clinical parameters offers a holistic perspective on the potential clinical benefits of this strategy. The observed correlations emphasize the importance of maintaining optimal vitamin D status for immune responses, calcium homeostasis, and overall health. The findings underscore the potential clinical benefits of calcifediol supplementation as an adjunct to vaccination strategies, offering avenues for personalized healthcare approaches and improved immune outcomes.

OP17. TAXONOMIC CHARACTERIZATION OF SOME MORPHOLOGICALLY SIMILAR SPECIES OF GENUS BAUHINIA PLUM. EX L.

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ABSTRACT

The taxonomic characterization of angiosperms is very complex not only because of their diverse taxa but also resemblance amongst the members of same species. The morphological features are unique and conventional parameter for species identification. The genus *Bauhinia* belongs to family Fabaceae and comprised of more than 300 species which are distributed throughout Africa, Asia, and South America. Members of this genus are characterized by a special cow's hoof-like lobed leaves and showy flowers. These species are of high medicinal importance for the treatment of various ailments, such as diabetes, skin infections, inflammation, wounds and diarrhoea. The similar looking leaves in some species are misleading towards taxonomic analysis. Thus, the correct identification is important and is highly required. The aim of this investigation is to compare the morphology of some Bauhinia species using conventional and microscopic methods. The distinctive morphological features may resolve the taxonomic status of the species under investigation. The observations at the species level may serve as a diagnostic tool to compare closely related species.

OP18. REGENERATION STATUS AND PHYTOSOCIOLOGICAL STUDY OF RAIPUR FOREST RANGE, GARHWAL HIMALAYA

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ABSTRACT

Our study aimed to analyze the structure and regeneration status of the Raipur Range in the Mussoorie Forest Division of Garhwal Himalaya. The range is located between 30°14'08" and 30°25'10" North latitude and 78°02'58" to 78°16'32" East longitude. We used a sample plot size of 0.1 hectares at the study site to analyze the distribution of tree species in the Raipur Forest Range. We recorded a total of 14 tree species in the range, with *Shorea robusta* being the dominant species with a frequency of 70% and IVI of 193.99. *Senegalia catechu* had the second-highest IVI of 30.32 and a frequency of 15%. We recorded four trees with a 10% frequency, while seven trees had the lowest frequency of 5%. The minimum IVI was reported for *Butea monosperma* of 3.22. The A/F ratio ranged from 0.15 to 3.0. We recorded a species richness of 14 for trees, with a concentration of dominance (Cd) calculated as 0.572. The H' value was recorded as 0.964, and the value of evenness (J) was calculated as 0.365. We also analyzed the regeneration status of individual tree species at 11 different sites in the Raipur Forest Range. However, we found that three sites, namely Maldevta, Dwara, and Rajpur, showed no regeneration due to high anthropogenic pressure in these sites as they are peripheral to village clusters and are the source of the number of forest resources.

OP19. MYCORRHIZAL FUNGI ACCELERATE LITTER DECOMPOSITION RATES IN FOREST ECOSYSTEMS

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ABSTRACT

The presence of mycorrhiza in the forest soil can either increase or decrease the litter decomposition rates either by facilitation or competition. However, empirical evidence about the magnitude and direction of such effects remained unclear. We conducted a formal meta-analysis of published peer-reviewed literature to address this knowledge gap in the present study. Surprisingly, a systematic literature search with pre-defined inclusion criteria identified only five comparable studies. Therefore, based on 14 estimates from these studies, we evaluated the effects of mycorrhizal association on litter decomposition rates for nine species. Our meta-analysis with the random-effect model showed strong evidence (RR = 1.07, Z = 3.58, $p < 0.001$) for increased litter decomposition rates in the presence of mycorrhizal fungi. The variations in the effects were influenced by species identity, but no effects were observed due to phylogeny. Thus, we found support for the mycorrhizal-mediated acceleration of litter decomposition, which questions the generality of the 'Gadgil effect.' Overall, our findings suggest that the inclusion of mycorrhizal effects can advance our understanding of nutrient cycling and its responses to global environmental change. However, we need more studies conducted for a longer duration and representative of diverse ecosystems and litter types to arrive at a more robust conclusion.

OP20. PSYCHOLOGICAL TRAUMA & POLYCYSTIC OVARY SYNDROME: AN ANTHROPOLOGICAL INVESTIGATION

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ABSTRACT

Introduction: Polycystic Ovary Syndrome (PCOS) is a prevalent endocrine condition that affects around 5% to 10% of women during their reproductive years. Symptoms include irregular menstrual periods, excessive facial/ body hair growth, acne, and reproductive problems. Psychological trauma may play a role in the development or exacerbation of PCOS. Women who have a history of childhood abuse, recent traumatic experiences, or past traumas are more likely to acquire PCOS than those without such experiences. The precise reason of how psychological trauma causes PCOS is yet unknown, while stress is thought to play a substantial role in altering the hypothalamic-pituitary-adrenal axis and causing hormonal disturbance. Material & Method: This pilot study was conducted on the outpatients of the Department of Gynaecology within the Government Multi-Speciality Hospital (GMSH), Sector 16, Chandigarh. The study focused on women residing in the Chandigarh Capital Region (CCR) who were diagnosed with PCOS. To gather insights into the experiences and the development of PCOS symptoms, in-depth interviews were conducted with these women, utilizing purposive sampling approach. Conclusion: The qualitative information obtained from

interviews indicated that women who had encountered psychological trauma previously or were currently going through stressful situations exhibited noticeable symptoms of PCOS. This suggests a potential link between their PCOS and the traumatic experiences they have endured. The incidents recorded during data collection were divorce, issues with in-laws or personal connections, sick family member, etc. To establish a clear cause-and-effect relationship and deeper understanding of the underlying mechanisms, further research in this area is needed**.**

OP21. TATTOO MARKS IN GENERATING BIOLOGICAL PROFILE: IMPLICATIONS IN HUMAN IDENTIFICATION

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ABSTRACT

Identification is the primary step in all medico-legal investigations. Unknown human bodies are often recovered in various types of crimes including homicide, suicide, mass murder, train accidents, aero-plane crash, road accidents, explosion, fire and natural disasters etc. Deceased are primarily identified by their facial profiles. However, cases may lead to unidentifiable faces or deliberately mutilated faces. Therefore, in such situations forensic experts search for other features of identification. Tattoo marks may prove of supreme importance in such situations. Individuals often ink various types of symbols and designs on their body parts. These tattoo marks are found to be often associated with individual's gender, age, geographical region, ancestry, ethic group, psychological status, like/dislike, religious believes, social status and perspectives towards society. Besides this information, tattoo marks may bear the full name or initial letter of individual's name or his/her relative or loved one's name. These specifications may help in generating biological profile of the deceased by finding the gender, age, area of origin, ethnicity etc. and identifying the individual with high accuracy. Thus present communication is an attempt to enlighten the importance of tattoo marks in narrowing down the investigation and medico-legal identification of unknown deceased.

OP22. CHALLENGES IN TAXONOMIC CHARACTERIZATION OF PLANTS WITH SPECIAL REFERENCE TO SOME SPECIES OF GENUS EUPHORBIA

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ABSTRACT

The plant species are an integral component of the global biodiversity. They are supporting various life forms including the human being. Plant species are a very good source of food, fodder, fuel, timber, fibre, medicine etc. The plants and their respective parts are useful in the preparation of medicines to treat human health disorders. The efficacy of the herbal preparation depends upon the collection of the correct material. The accurate identification is a challenging task, particularly for species which have close morphological resemblances. Euphorbia is a morphologically diverse genus with 2150 species in the world and 195 in India.

It possesses a wide range of growth forms such as herbs, shrubs, trees and succulents. Certain species of the genus Euphorbia even are difficult to characterize because of their macro morphological similarities, morphological plasticity and convergence of certain morphological characters. Moreover, the occurrence of different ecotypes and intraspecific variations is very common among the species. The genus *Euphorbia* is known for its unique inflorescence known as "Cyathium." Traditionally, *Euphorbia* species are used in asthma, eczema, cancer, skin infections, inflammation, relieving pain, wound healing etc. The misidentification of species may affect its use for medicinal purposes. Thus, a thorough investigation of the morphological features is required to establish the identity of the species to be used in medicinal formulations or even for their conservative measures.

OP23. INFLAMMASOME SIGNALING IS GENETICALLY REGULATED FOR INFLUENCING THE RISK OF ISCHEMIC STROKE

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ABSTRACT

Activation of NLRP3 inflammasome is an important event that not only triggers but also participates in the progression of inflammatory signaling within plaqued vessels. Genetic connotations of NLRP3 inflammasome for the risk of ischemic stroke (IS) has not been examined so far in India. In the present case-control study comprising 400 subjects (200 IS patients and 200 stroke-free controls), five SNPs; rs10754558, rs4612666, rs2027432, rs3738488, rs1539019 within NLRP3 gene and five SNPs within Caspase 1 gene; rs501192, rs481736, rs530537, rs580253, rs2282659 were investigated to determine their contributions for IS risk using different genetic models after adjusting the effect of significant variables. Plasma levels of two pro-inflammatory markers i.e. Interleukin-1beta (IL-1β) and Interleukin-18 (IL-18) were analysed by using ELISA kits. The results showed that minor alleles of three out of five SNPs within the NLRP3 gene (rs10754558, rs4612666, and rs1539019) and two SNPs within Caspase 1 gene (rs481736 and rs2282659) were associated with an increased risk of IS in additive, recessive, and multiplicative models. SNP rs501192 of Caspase 1 was observed to be protective for the risk of IS. Multivariable regression analysis identified higher levels of systolic blood pressure, IL-1β, and IL-18 as independent risk predictors for IS. The study demonstrated the role and relevance of NLRP3 and Caspase 1 gene as the genetic determinants of IS risk along with biochemical markers: IL-1β, and IL-18. This study paved the way to investigate novel and unforeseen inflammatory signaling pathway for the risk of IS in the population of Punjab, India.

OP24. CYTOKINE-RECEPTOR INTERACTIONS: THERMODYNAMIC INSIGHTS AND PREDICTIVE MODELING

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ABSTRACT

Cytokines are transiently produced, small non-structural signaling proteins. They regulate various aspects of immune functions; involved in both normal physiological processes and disease pathogenesis. Studies have shown that dysregulation of cytokines and their downstream signaling pathways has been linked to autoimmune disorders and cancer, emphasizing their significance in human biology and pathology. The study examines the captivating phenomenon of cytokines binding to various receptors in a manner that exhibits ligand pleiotropy and substrate redundancy, a puzzle that remains poorly understood. To unfold this mystery, the research employs cutting-edge in silico methods. The central hypothesis postulates the binding patterns of cytokine-receptor assembly, those are primarily driven by thermodynamic associations which sheds light on cytokine bioactivity. To test this hypothesis, a meticulously curated dataset of structural complexes featuring cytokines bound to their receptors has been collected. This dataset is a composite of experimentally determined structures from established databases with computationally generated models, courtesy of techniques like Modeller, HHPred, and the deep learning based AlphaFold model. Further, protein-protein docking algorithms are implemented for analysing the interactions among structural complexes. Study aims to harness this extensive dataset to construct a machine learning-based model for the prediction of cytokine activities. The endeavor could open new doors for structure-based cytokine engineering, offering promising prospects for advancing therapeutic interventions in immune-related diseases in future and beyond.

OP25. A COMPREHENSIVE CHECKLIST OF MOSQUITOES (DIPTERA: CULICIDAE) OF CHANDIGARH AND ITS SURROUNDING AREAS AND THEIR ECOLOGICAL AND EPIDEMIOLOGICAL SIGNIFICANCE

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ABSTRACT

Mosquitoes (Diptera: Culicidae) constitute a diverse and globally distributed insect group playing dynamic roles with substantial ecological and epidemiological importance. As vectors of diseases like malaria, dengue, Zika virus, Japanese encephalitis and West Nile fever, they play a pivotal role in shaping global public health landscapes. Their intricate interaction with pathogens and hosts facilitates efficient disease transmission. Out of 3600 species recorded worldwide, 404 species of them reported from India highlights its presence on all continents, occupying diverse ecosystems such as aquatic habitats, forests, urban and agricultural landscapes. Despite mosquitoes being medically important, the information about its faunal diversity is very scanty as far as Chandigarh and its nearby areas are concerned. Hence, the

present investigations have been carried out to survey the mosquito diversity from areas in and around Chandigarh. During present studies, a total of 36 species belonging to 8 genera viz; *Anopheles, Aedes, Armigeres, Culex, Coquillettidia, Mansonia, Mimomyia* and *Verrallina* have been recorded from various habitats of Chandigarh (June 2017–October 2023) of which 6 are new records. Hence, the present study provides information on the occurrence of mosquito vectors while emphasising their ecological roles and disease transmission significance. These investigations will be beneficial for the health authorities to adopt appropriate measures in time for the control of various disease vectors. The affirmation about the prevalence of mosquito species at a particular place and time is very significant, not only to predict future outbreaks risk but also to control the vectors in time.

OP26. A STUDY OF THE BIOLOGICAL SPECTRUM, PHENOLOGY, AND DIVERSITY OF RUDERALS AND AGRESTALS WEEDS IN MORADABAD DISTRICT

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ABSTRACT

Between April 2021 and June 2022, the patterns of species diversity, biological spectrum, habit, nativity, global risk score, and phenology of invasive weeds growing in the Moradabad district of Uttar Pradesh were studied. The analysis of invasive alien weed species reveals that there are 82 weed species classified as belonging to 64 genera, 25 families, 16 orders, and 8 grades of the APG-IV System of classification. According to the APG-IV Grade system, Grade Lamiids has 19 weed species, Superasterids has 16, Campanulids has 14, Fabids has 12, Commelinids has 10, Malvids has 9, Eudicots has one, and Asterids has one. The analysis of alien invasive weed species reveals that the top five dominant weed families are Asteraceae with 14 species, followed by Amaranthaceae with 9 species, Malvaceae with 7 species, Convolvulaceae with 6 species, and Poaceae with 6 species. The top five weed genera in this botanical study were *Alternanthera* with three species, *Ipomoea* with three species, *Senna* with three species, *Calotropis* with two species, and *Cuscuta* with two species. In the framework of Raunkier's Life Forms, 68% of weed species were classified as Therophytes, 14% as Chamaephytes, 7% as Hemi-cryptophytes, 6% as Phanerophytes, and 5% as Cryptophytes. The following are the life forms of reported weeds: There are 79% herbs, 13% shrubs, 4% climbing herbs, 3% creeping herbs, and 1% climbing shrubs. *Calotropis procera* had the highest weed risk score.

OP27. AILMENTS UNDER THE UNANI LENS: INVESTIGATING TREATED CONDITIONS AT THE DISPENSARY

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ABSTRACT

A comprehensive healthcare system, which speaks to each health condition in detail, is the Unani System of Medicine. This study was conducted to assess the awareness and utilization

pattern of Unani system of medicine in Chandigarh. The population of the study was patients who visited Government Unani Dispensary for the treatment of various ailments. The study was conducted at Government Unani Dispensary in Chandigarh. This study included 294 patients attending Unani OPD (April-May, 2023), among them, 144 were females and 150 were males. The sample was selected by using simple random sampling. This was an observational descriptive study was conducted using pretested, predesigned and structured schedule. Out of 294 subjects, majority of patients used Unani medicine for digestive disorders (33.33%), respiratory issues (25.51%), joint & muscle pain (21.09%), sexual health (7.14%), fever (6.80%), urinary issues (7.14%), and skin conditions (5.78%). Patients were observed to be suffering from various conditions concurrently. Some patients were also used it for general weakness, stress &anxiety, menstrual disorders, diabetes, cardiovascular health, and hair & scalp issues. Some patients had multiple ailments for which they used Unani medicine. Furthermore, this paper included the reasons for which people preferred this medical system. It can be concluded that Unani medicine is widely used by people but results cannot be generalize to whole population.

OP28. FABRICATION OF NOVEL POLYMERIC MICROCHIP FOR ON-SITE EXTRACTION OF HUMAN GENOMIC DNA AND ITS COMPARISON WITH FTA® PAPER

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ABSTRACT

Advanced DNA extraction methods have evolved from traditional organic extraction procedures to automated platforms to carry out fast sample processing and analysis. However, these new devices are expensive; therefore, there is consistent unmet demand for an alternative low cost, rapid and simple extraction protocol. With the advent of "Lab-on-a-chip" technology in the form of membranes or beads, an advanced technique for DNA extraction, offering fast analysis, minimal sample requirement with less contamination has emerged to meet the requirements. The present study reports fabrication of a polymer based microchip offering rapid and low cost extraction of DNA from forensic samples in a short time. The microchip was prepared by introducing a disc of fusion 5-filter paper between two Poly (methyl methacrylate) (PMMA) layers where the activated polymer substrate acted as a solid DNA binding phase. DNA extraction from human blood was carried out on a microchip using an alkaline extraction method and quantitated using RT-PCR followed by amplification and STR genotyping. The DNA binding capability of the fabricated microchip was evaluated and compared with the FTA paper by measuring the concentration of DNA in the final elutes using RT-PCR. On-chip DNA extraction suggests that the DNA holding capacity of the fabricated microchip was better than the FTA paper. The efficiency of the fabricated microchip for DNA isolation from blood, refractory to DNA concentrations in the elute is significant as compared

to FTA paper. The device is cost effective and efficient; therefore, it is expected to succeed in cases where DNA quantity is low.

OP29. EXPLORING THE ENIGMATIC HISTORY OF CHINTPURNI TEMPLE OF DISTRICT UNA, HIMACHAL PRADESH

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ABSTRACT

The Chintpurni temple nestled in the serene foothills of the Western Himalayas in the District Una (Himachal Pradesh), is a sacred pilgrimage site that has attracted devout worshippers for centuries. This temple is dedicated to the femine divine energy and Hindu goddess Chhinnamastika/ Chhinnamasta, which is, a form of the Goddess Durga and is often depicted as a self-decapitated goddess holding her own severed head in one hand and a sword in the other. This form of the goddess symbolizes the transcendence of the ego and self-sacrifice. This research delves into the rich and enigmatic history of Chintpurni temple, tracing its origin and enduring significance in its religious and cultural tapestry of India. The study is based on primary as well as secondary data, drawing data from in-depth interviews and from an extensive array of historical sources, including ancient scriptures, gazetteers, traveller's accounts, oral traditions, legends, and myths. Chintpurni temple has an enduring popularity, attracting pilgrims across India, as well as well as from distant corners of the world. As the temple has gained so much of popularity, it has a great socio-economic impact on the surrounding region, emphasising its role in promoting tourism and local commerce. A comprehensive exploration of Chintpurni temple's history contributes to our understanding of the intricate interplay between culture and society in the Indian Sub-continent.

OP30. EXPLORING ANTI-CANCER POTENTIAL OF BIOSURFACTANT FROM ENDOPHYTIC BACTERIA ON HUMAN ACUTE T CELL LEUKEMIA CELLS (JURKAT, CLONE E6-1)

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ABSTRACT

We investigated the in vitro anticancer potential of endophytic bacteria from a medicinal plant, on human acute T cell leukemia cells (Jurkat, Clone E6-1). During the initial screening, we generated a library of 52 endophytes. Among these strains, RSS 2 stood out as a prolific biosurfactant producer, showcasing significant anticancer activity. The biosurfactant was purified and characterized using advanced analytical techniques such as HPLC, LC-MS, FTIR, and C13 and H1 NMR. The bacterial isolate RSS2 was identified as *Bacillus safensis* through phylogenetic analysis of the partial 16s rRNA genes using BLASTn. The cytotoxic potential of the extracted rhamnolipid was evaluated by MTT assay, and the IC50 value was found to be 250±0.4 µg/mL after 24 hrs of exposure. No cytotoxicity towards normal PBMC's from healthy individuals was reported. We further reported apoptosis induction in 22.6% of

leukemia cells after treatment with the biosurfactant using Annexin V and PI assay. The study marks a significant stride towards harnessing endophytic bacteria as a source of bioactive compounds with potential anti-cancer potential.

OP31. INSIGHTS INTO KINETIC CHARACTERIZATION OF NOVEL THERMOSTABLE LYTIC POLYSACCHARIDE MONOOXYGENASE FOR BIO-CATALYTIC DEGRADATION OF LIGNIN DERIVED B-O-4 COMPOUNDS: PAVING WAY FOR LIGNIN VALORISATION

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ABSTRACT

In response to the alarming rise in the demand for fuels and chemicals, lignocellulosic biomass (LCB) has emerged as a sustainable and environmentally benign substitute to the use of fossil fuels. Lignin is the polymeric component of LCB. Bio-catalytic degradation of lignin is highly challenging owing to its recalcitrant structure and the presence of complex linkages like β-O-4. The impeccable oxidation potential of different types of Lytic polysaccharide monooxygenases (LPMO) has made them excellent choice of enzymatic cocktails for the degradation of polysaccharides in biomass. However, their oxidative ability is yet to be explored for depolymerization of lignin. In our study, we have identified and characterized a novel LPMO for the oxidation of lignin. The identified LPMO was synthetically modified by adding Methionine (MET 1). Biochemical characterization revealed the optimum activity of LPMO at pH 7 in water as the solvent and at 100oC. Identified LPMO was also found to be stable even after 5 consecutive cycles of autoclaving at 121oC and 15 psi. Detailed characterization using GC-MS, UPLC and NMR revealed that LPMO was able to cleave β-O-4 of lignin derived compound (guaicyl glycerol β-guaicyl ether) into its monomeric product guaiacol. Michaelis-Menten kinetics for LPMO-AOAA17 revealed Vmax and Km of LPMO to be 4.75±0.404 mM and 3.566±1 M-1s-1, respectively. Computational studies involving molecular docking and molecular dynamic simulation studies revealed the binding of GGE to around the copper active site of LPMO. Hence, a novel LPMO was found which could hold a promising future for depolymerization of lignin.

OP32. ASYMBIOTIC SEED GERMINATION OF A THREATENED AND MEDICINALLY IMPORTANT INDIAN ORCHID, CYMBIDIUM ALOIFOLIUM (L.) SW.

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ABSTRACT

Cymbidium aloifolium (L.) Sw. is an epiphytic and medicinally important orchid species which is distributed in different parts of India. Different parts (rhizome, root, seeds, leaf and whole plant) of this species are used to cure various ailments such as bone fracture, rheumatism,

healing wounds, fever, and weakness of eye. It is also valued as potted plant due to its attractive flowers. This species is threatened in nature because of low germination rate and over exploitation. Therefore, to protect this exquisite orchid, an effective conservation approaches are required. In the present study, immature seeds procured from green pod (21 wap) were used to produce effective *in vitro* asymbiotic seed germination protocols for *C. aloifolium*. For asymbiotic seed germination, MS (Murashige and Skoog, 1962) medium was used with different plant growth regulators (IAA, NAA, BAP, KN- singly or in combinations at the concentration of 0.5mgl-1), coconut water (CW- 5 and 10%) and other supplements (P, YE, CH, AC- 2gl-1 each). Highest germination frequency (85.00±0.40%) was observed in the combination of MS+CW at 10%. Early onset of seed germination was observed on MS medium supplemented with NAA+KN within 13.00±0.70 days, while IAA+BAP in MS medium proved best for early first leaf, first root and complete seedling formation in 92.50±0.28, 119.75±0.25, 136.25±0.62 days, respectively. Seedlings were acclimatized and transferred to greenhouse conditions and 65% survival rate was recorded. The presented protocol can be used for rapid mass multiplication of this orchid, which will help to alleviate collecting demands on its natural populations.

OP33. EXOSOME MEDIATED NON-TARGETED EFFECTS OF 177LU-DOTATATE THERAPY IN NEUROENDOCRINE TUMOR

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ABSTRACT

177Lu based targeted radionuclide therapy (TRT) or 177Lu-DOTATATE therapy, is an important treatment modality for the management of neuroendocrine tumor. However, the risk of radiation treatment-related complications is becoming a growing challenge. It is well documented that in conventional radiotherapy redox mechanisms play a key role in non-targeted effects (bystander effects/ abscopal effects). However, there is lack of evidence for the same in case of radionuclide therapy. Extracellular vesicles i.e. exosomes help in exchanging information by sending out signals. Therefore, it is highly probable that there exists a communication via exosomes through systemic circulation originating from the target site of the radionuclide therapy and spreading the non-targeted damages at the distant sites. Hence, the present study is conceived to investigate the phenomena occurring at the interface of the radionuclide and ROS generation via exosomes. In the same light, the present Study elucidated the redox state of peripheral blood mononuclear cells (PBMCs) in untreated verses treated patients (177Lu-DOTATATE). Further, *in vitro* investigations were performed in untreated verses exosomes treated PBMCs to affirm the role of exosomes in altering the redox status. Further, the DNA damage was assessed by checking the accumulation of phosphorylated γH2AX (phosphorylation of the Ser-139 residue of the histone variant H2AX) and was found to increase after therapy. Therefore, the present study concludes that exosomes play a crucial role to propagate ROS generation at non-targeted sites and further studies are

warranted to investigate its mechanistic insights to improve the outcome of TRT in cancer patients.

OP34. HARNESSING GUT MICROBIOTA-DERIVED SHORT-CHAIN FATTY ACIDS FOR ATTENUATING HIGH-FAT DIET-INDUCED METABOLIC SYNDROME: INSIGHTS AND THERAPEUTIC PROSPECTS

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ABSTRACT

Metabolic Syndrome (MetS) embodies a constellation of metabolic irregularities that heighten susceptibility to cardiovascular disease, type 2 diabetes, and neurological disorders. Genetics, sedentary lifestyles, and high-calorie diets synergistically underpin MetS, manifesting as weight gain, insulin resistance, dyslipidemia, and chronic inflammation. Recent insights implicate gut microbiota dysbiosis as a pivotal contributor to MetS, sparking interest in rectifying this dysbiosis for improved management. An innovative avenue in this endeavor is the emerging concept of "postbiotics," exemplified by short-chain fatty acids (SCFAs). SCFAs, the bioactive byproducts of gut microbiota fermentation of dietary fibers, include acetate, propionate, and butyrate, which intricately modulate host physiology. The current study strategically employs SCFAs to address gut dysbiosis, thereby mitigating the adverse effects of high-fat diet (HFD)-induced MetS. Empirical evidence from the study highlights the efficacy of SCFA supplementation in ameliorating key MetS parameters. SCFAs effectively curtailed body weight gain and fasting blood glucose levels in HFD-exposed rats, countering unfavorable metabolic shifts. Additionally, SCFAs exhibited significant reductions in triglycerides, total cholesterol, and LDL-cholesterol levels while partially restoring HDL-cholesterol levels, suggesting a promise in regulating lipid metabolism. Notably, SCFAs mitigated liver enzyme activities, indicating potential alleviation of HFD-induced liver damage. Furthermore, SCFA treatment displayed potential renal protection and a reduction in oxidative stress markers. Histological analyses affirmed SCFAs' capacity to alleviate liver changes induced by HFD. The current study not only elucidates the intricate role of microbiome-derived metabolites but also holds transformative potential for the management of MetS, thereby advancing holistic health outcomes.

OP35. EXPLORING ROAD RAGE DYNAMICS IN INDIA: ANALYZING AGE, MINDFULNESS, AND SPATIAL ANXIETY EFFECTS ON FEMALE DRIVERS

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ABSTRACT

Road rage, a globally under-addressed issue, significantly contributes to road traffic incidents. This concern is particularly prominent in India, necessitating focused attention. Our study

investigates how age, mindfulness, and spatial anxiety influence driving-related anger in female drivers. In our research, we selected 100 licensed female drivers from Panjab University, Chandigarh, divided into two groups: 50 young adults and 50 middle-aged adults. To assess our variables, we employed the 14-item Driving Anger Scale (DAS), 15-item Mindfulness Attention Awareness Scale (MAAS), and 24-item Spatial Anxiety Scale (SAS). Our findings reveal that while minor mean value differences exist, there is no significant distinction in mean driving anger and spatial anxiety values between age groups ($p > 0.05$). Notably, middle-aged adults exhibit significantly higher mindfulness scores than young adults ($p = 0.004$). Additionally, middle-aged adults demonstrate a notable positive correlation between spatial anxiety and driving anger ($r = 0.502$; $p = 0.024$). In conclusion, our study emphasizes the importance of assessing individuals' psychological states, advocating for targeted interventions like mindfulness training and emotional regulation. These measures should be prerequisites before granting permanent driving licenses. As road rage remains a pressing concern, our findings underscore the urgency of proactive measures to mitigate its impact and enhance overall road safety.

OP36. HEART–ON–A–CHIP: DISEASE MODELING AND DRUG DEVELOPMENT

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ABSTRACT

As per World Health Report 2023, more than half a billion people around the world are affected by cardiovascular diseases, it raises a concern for the development of novel drugs to prevent and successfully treat them. Advancements in drug discovery system contribute to the development of new treatments for cardiovascular diseases. For Accurate drug screening and pathophysiological disease modeling, effort is made to develop microfluidic systems to recapitulate native cardiovascular microenvironments – Organ on a Chip (OOAC) Platform. It has advantages over conventional 2D culture systems and animal models like high reproductivity, physiological relevance, drug screening models for personalized therapy, negligible ethical concerns and good controllability. Organ chip systems comprises of myocardium, vasculature, or cardiac–vascular interactions which mimic structural organization, flow shear stress, mechanical tension, transmural force, and electrical activity. The heart – on a chip can be generated by aggregating cell suspension of human pluripotent derived stem cells (PSC) in a medium or gel matrix. These human PSC-derived embryoid bodies are attached to hydrogels conjugated with collage shows similar characteristic of myocardium. The fabrication and perfusion of multiscale vasculature and tri-leaflet valves achieved by controlled pH-driven gelation, for cellular infiltration and micro vascularization. This technology was based on the FRESH (freeform reversible embedding of suspended hydrogels) bioprinting and reproduce the primary structural and mechanical characteristics of the human heart. There are different Heart – on – a - chip disease models for dilated cardiomyopathy, Heart failure, Hypoxia-induced myocardial injury which will be useful for understanding pathological cardiac remodeling.

OP37. THERAPEUTIC MANIPULATION OF PATIENT HAEMATOPOIETIC STEM CELLS VIA EX VIVO PRIME EDITING STRATEGY FOR THE TREATMENT OF SICKLE CELL DISEASE

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ABSTRACT

SCD is an autosomal recessive disorder caused by an A.T-to-T.A transversion mutation resulting in an E6V substitution in the beta subunit of haemoglobin. At low oxygen tension, HbS forms rigid polymers that cause characacteristic erythrocyte shape changes and initiate a complex pathophysiology and clinical manifestations. The only FDA-approved cure for SCD is allogeneic hematopoietic stem cell transplantation, waned by a lack of ideal donors, graft-vs-host disease and graft rejection. Many strategies for therapeutic manipulation of HSPCs are being examined in clinical trials for the treatment of SCD, but pose disadvantages such as the formation of DSBs, low edit-to-indel ratios, chromosomal abnormalities, HSC engraftment impairment and transfusion-dependent pancytopenia. Reverting the SCD E6V substitution, which requires a T·A-to-A·T transversion, represents the most physiological approach for disease correction. Discussed here is a prime editing (PE) strategy that reverts the SCD allele back to wild-type HBBA with high on-target efficiency, low frequencies of indel by-products and minimal off-target editing. Edited SCD patient HSPCs maintained prime editing levels at 17 weeks after transplantation in mice, with an average of 42% of engrafted human erythroblasts and reticulocytes across four patient donors containing at least one wild-type HBBA allele, indicating robust editing of hematopoietic stem cells at levels that exceed the estimated therapeutic threshold. Treated cells also showed a significant reduction in sickling when cultured in hypoxic conditions.

OP38. ANTIFERTILITY EFFECT OF ANDROGRAPHOLIDE BASED BAIT IN MALE HOUSE RAT, RATTUS RATTUS

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ABSTRACT

Andrographolide has been reported to have antifertility effects. During present investigation, three separate baits (1, 2 & 3), prepared using different concentrations of andrographolide (0.0125, 0.025 and 0.050% in wheat based bait) were fed to male house rats under bi-choice condition in order to identify the effective dose in bait with antifertility effect. Results revealed avoidance towards bait for few days but after that rats developed habituation towards all the treated baits. Consumption of active ingredients mixed in baits ranged from 8.55 to 45.45 mg/100g body weight. Results also revealed a significant decrease in progressive sperm motility, concentration, and viability and an increase in the percentage of sperm with different structural abnormalities in rats fed on bait 3 prepared using 0.05% andrographolide. Additionally, rats fed on bait 3 showed significant reduction in the number of both germ and Sertoli cells in the seminiferous tubules of various stages of the seminiferous epithelial cycle (SEC). Level of various sex hormones also reduced significantly in rats fed on bait 3.

However, cellular dissociations were not seen in any of the stage of SEC and antifertility effects observed in rats fed on bait 3 were reversible after 15 days of the termination of treatment. These results indicated a need to increase the bioavailability of andrographolide in bait to increase its efficacy as an antifertility agent.

OP39. AN INNOVATIVE NEEM SEED EXTRACT AND ANDROGRAPHOLIDE BASED BAIT WITH TOXIC AND ANTIFERTILITY EFFECTS FOR THE MANAGEMENT OF RODENT PESTS

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ABSTRACT

House rat, *Rattus rattus* is a predominant pest in commensal situations. Trapping is a common method for their management in commensal situations. Reproductive potential of the residual population left after trapping increases at a very high rate due to more availability of food resources. There was a need to develop a safe product for instant and long term reduction in their population. Neem seed and andrographolide extracts (NSA) based bait, formulated in our laboratory to increase the palatability, stability and bioavailability of secondary metabolites was found to have both toxic and irreversible antifertility effects against both sexes of house rat. During present study, NSA bait was fed to rats in selected commensal locations, badly infested with rodent pests to validate its efficacy under real field conditions. After the treatments period, rats trapped from treated fields were necropsied to determine its antifertility effect. Consumption data indicated good palatability of formulated bait. From all the selected locations, dead rats were found confirming toxic effect of NSA bait. Sperm parameters (% motility, viability, morphology and concentration) and duration of estrous cycle were found to be affected in rats trapped from the treated locations. Study on the testicular histomorphology indicated disorganization of germinal epithelium, shrinkage of seminiferous tubules, and absence of spermatids in rats trapped from treated locations. These results confirmed both toxic and antifertility effect of NSA bait against rodent pests. It can be used for safe and long term management of rodent pests.

OP40. THIAMETHOXAM DEGRADATION BY SALMONELLA ENTERICA STRAINS ISOLATED FROM AGRICULTURAL SOILS

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ABSTRACT

Microbial processes play an important role in the biological degradation of pesticides. Using the enrichment culture technique, nine morphologically distinguishable bacterial species with the ability to utilize thiamethoxam as the sole source of carbon and nitrogen were isolated from agricultural field soils. In mineral salt medium (MSM) supplemented with 50 µg ml-1 thiamethoxam (MSMT), these bacterial isolates caused active degradation of thiamethoxam ranging from 16.63 to 35.52% within 15 days. Based upon 16S rDNA nucleotide sequence

homology with GenBank database and phylogenetic analysis, the most potent bacterial specie was identified as a new strain that is closely related to Salmonella enterica subsp. enterica serovar Heidelberg str. B182, with a reduced identity of 96%. The bacterial specie grew optimally under shake culture conditions, at 37°C with an initial pH of 6.0-6.5 and the use of these optimum cultural conditions resulted in improved thiamethoxam degradation by the bacterial species. The bacterial species caused maximum thiamethoxam degradation only in the presence of thiamethoxam as the sole source of carbon and energy and the same was reduced in the presence of easily metabolized able carbon (C0 and C1) and nitrogen ((N0, N1 and N2) sources. This could be attributed to the involvement of repressible metabolic pathways, reactions of which are inhibited by the presence of easily available nutrients for growth. Besides the above, thiamethoxam degradation by the bacterial species did not produce any detectable products suggesting complete degradation of this insecticide.

OP41. SOLANUM INSANUM – S. MELONGENA INTROGRESSION LINES SUSCEPTIBLE TO EGGPLANT JASSID SUFFERED HIGH OXIDATIVE STRESS WITH INCREASED PHENOLIC ELEMENTS

Sysha Handa[1], Rimaljeet Kaur[1], Anju Sharma[1], Mohinder Kaur Sidhu[2], Harpal Singh Bhullar[2]

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ABSTRACT

Amrasca biguttula biguttula (Ishida) evolution as eggplant destructive pest in recent years enforced vegetable scientists at Punjab Agricultural University, Ludhiana to devise a strategy of managing its' infestation. Varietal resistance could be a crucial and efficient approach to counteract pest damage. Pest resistant introgression lines from wild cultivar, *Solanum insanum* and susceptible recipient, *S. melongena* were developed as *S. insanum* is an enriched source of resistance to various pests and pathogens. Developed ILs on the basis of jassid population per plant and severity of pest damage displayed variable resistance and were classified into highly resistant, moderately resistant, moderately susceptible and highly susceptible categories. Responsive elements during eggplant-jassid interactions have not been explored at biochemical level. We attempted to determine the stature of H_2O_2, polyphenol oxidase (PPO), guaiacol peroxidase (GPX) and total phenolics (TPC) in eleven *S. insanum* ILs following jassid infestation. Genotypes suffered from severe jassid infestation exhibited high oxidative stress characterized by significant increase in H2O2 concentration which triggered the expression of PPO activity and the accumulation of phenolic compounds. At low pest infestation stage [60 days after transplanting (DAT)], PPO activity was downregulated while GPX increased remarkably. However, with pest progression, the PPO activity was consistently increased. TPC decreased initially in moderately resistant and highly susceptible genotypes but spiked significantly by 80 DAT. A positive and significant association of JPP was observed with PPO, H_2O_2 and TPC taken altogether.

OP42. GENOME EDITING: THE NEXT GENERATION OF MEDICINES

Tamanna[1]

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ABSTRACT

Human genome editing has the potential to advance our ability to treat and cure disease. Potential benefits of human genome editing include faster and more accurate diagnosis, more targeted treatments, and prevention of genetic disorders. Somatic gene therapies, which involve modifying a patient's DNA to treat or cure a disease, have been successfully used to address HIV, sickle-cell disease etc. The technique could also vastly improve treatment for a variety of cancers. However, some risks exist, for example, with germline and heritable human genome editing, which alter the genome of human embryos and could be passed on to subsequent generations, modifying descendants' traits. So, it's important to have insights into various aspects of genome editing including its applications and challenges associated with it.

ABSTRACTS OF POSTER PRESENTATIONS

PARTICIPANTS

S. No.	Name of participant	Affiliating institution	Title of abstract
1.	Harpriya Singh	Department of Psychology, DAV College, Sector 10, Chandigarh	Languishing - A recent perspective
2.	Priyanka Mahajan	School of Basic and Applied Sciences, Maharaja Agrasen University, Baddi	Ameliorating potential of β-pinene studied at anatomical and cytological level in chromium affected plants
3.	Purnima Bhandari, Yashasvi	Mehr Chand Mahajan DAV College for Women, Chandigarh	Effect of salt stress on germination dynamics and seedling development in chickpea genotype
4.	Abhinashi Singh Sodhi	GGDSD College, Sector-32, Chandigarh	Culture independent assessment of sohna geothermal spring
5.	Aastha Sharda	Deaprtment of Botany, Panjab University, Chandigarh	How rising temperature is affecting the food security?
6.	Abhishek Kumar	Soil Ecosystem and Restoration Ecology Lab, Department of Botany, Panjab University, Chandigarh	Patterns and determinants of plant species richness along an elevational gradient in Western Himalayas
7.	Aditi Rana	Department of Botany, Panjab University	Plant essential oils as promising biopesticides for future
8.	Akansha Rana	Department of Anthropology, Panjab University Chandigarh	Exploring the potential of forensic genetic genealogy in identification
9.	Akhil Pratap	Plaksha University, Punjab	Unraveling allosteric mechanisms governing bacterial transcriptional repression in sugar acid metabolism
10.	Ameesha Verma	Department of Zoology Panjab university Chandigarh	eDNA: Non-invasive molecular tool for wildlife monitoring purposes
11.	Anju	Department of Zoology, Kurukshetra University, Kurukshetra	Preliminary investigations on avifaunal diversity of Mangar Bani forests in Aravalli range, Faridabad, Haryana

12.	Ashutosh Kumar Singh	Department of Biotechnology, Panjab University, Chandigarh	Epilactose biosynthesis using novel cellobiose 2-epimerase variant from the geothermal metagenome of Chhattisgarh
13.	Chhering Dorje	Department of Botany, Panjab University, Chandigarh	Biochemical profiling, antioxidant and antimicrobial activities of Thysanolaena latifolia (Rxb. Ex Hornem.) Honda collected from cold desert region of Himachal Pradesh, India
14.	Damini Siwan	Institute of Forensic Science and Criminology, Panjab University Chandigarh	Bite marks: Evidence or a mislead – Case studies of exoneration of wrongfully convicted people by a legal initiative called "Innocence Project"
15.	Deeksha Padhiar, Sarbjeet Kaur	Department of Botany, Panjab University, Chandigarh	Artificial intelligence in agriculture
16.	Diksha Muwal	Department of Botany Panjab University Chandigarh	GC-MS analysis and antimicrobial activity of methanol extract of Isopterygium albescens
17.	Etika Jain	Department cum National Centre for Human Genome studies and Research	Overexpression, purification and unfolding studies on a metagenomic lipase
18.	Geetika Sharma	Guru Nanak Dev University, Amritsar	Analyzing the toxicity potential of p-chloroaniline in liver and gill of Channa punctatus using different genotoxic and biochemical markers
19.	Gurkirat Singh Sekhon	Department of Zoology, Punjab Agricultural University, Ludhiana, Punjab	Diversity of avian trophic guilds in relation to habitat heterogeneity at village ponds
20.	Gurpreet Kaur	Department of Zoology, Punjab Agricultural University, Ludhiana	Manipulation of fields rats behaviour using repellent based formulation and its practical application in crop fields in integration with trapping for rodent pest management

21.	Kritika Sharma	Department of Zoology, Kurukshetra University Kurukshetra	Antioxidant and phytochemical profiling of medicinal spice (Cinnamon zeylanicum) by using solvents of different polarity
22.	Maanniya	Department of Biotechnology, Panjab University, Chandigarh	Lectins identified from Abelmoschus esculentus
23.	Madhu	Department of Botany, Panjab University, Chandigarh	GC-MS analysis of bioactive compounds from methanolic extract of formulation used against snakebite
24.	Madhu Sharma	Department of Zoology, Panjab University, Chandigarh	Morin as a therapeutic intervention for gestational stress-induced gut aberrations in the F1 generation
25.	Madhu	Department of Botany, Panjab University, Chandigarh	Exploration of glutathione reductase and monodehydroascorbate reductase genes of bread wheat
26.	Mandeep Kaur	Dept. of Zoology, Panjab University, Chandigarh	From streams to plates: The perils of heavy metal toxicity in edible fish
27.	Manisha Sharma	Department of Biotechnology, Panjab University, Chandigarh	Antibacterial activity of phytocompounds of the plant Tribulus terrestris against E. coli: In-silico approach
28.	Meena Kumari	Department of Botany, Panjab University, Chandigarh-160014	24-Epibrassinolide modulating physiology and growth characteristics of cadmium stressed soybean [Glycine max (L.) Merr.]
29.	Meenu	Institute of Forensic Science and Criminology, Panjab University, Chandigarh	Advances in environmental forensics: Applications in the identification and treatment of industrial effluent
30.	Monika Monika	Kurukshetra University, Kurukshetra	Study of total polyphenol and total flavonoid content in variously processed garlic extracts (HG17)
31.	Mohini Thakur	Department of Zoology, Panjab University, Chandigarh	Acute toxicity of an emerging herbicide, diuron in major freshwater carps

32.	Monika Thakur	Center of Innovative and Applied Bioprocessing (DBT-CIAB), Sahibzada Ajit Singh Nagar 140306, India	The diversity of the microbial community and potential for hydrocarbon and carbohydrate degradation in a Himalayan artificial lake are shown by a thorough metagenomic investigation approach
33.	Muskan Budhwar	Cell and Molecular Biology Lab, Department of Zoology, Panjab University, Chandigarh	Polyethylene-nanoplastic induced behavioural alterations and neurotoxicity in wistar rats
34.	Nasmeen Hakim	Department of Botany, Panjab University, Chandigarh	Impacts of alien invasive plants on soil nutrients in different altitudes are correlated with soil enzyme activities: Insights from Cirsium arvense (L.) Scop. in the arid region of Leh, Ladakh
35.	Navjot Sharma	Department of Biochemistry, Punjab Agricultural University, Ludhiana-141004, India	Enzymatic antioxidant expression of Okra in relation to yellow vein mosaic virus
36.	Neha Dogra	Department of Botany, Panjab University, Chandigarh-160014, India	Phytochemical analysis and antioxidant activity of liverwort Marchantia palmata from Himachal Pradesh
37.	Neha Thakur	Department of Botany, Panjab University, Chandigarh	HD-ZIP transcription factors in orchids: A study in silico
38.	Pallavi Sharma	Department of Microbial Biotechnology, Panjab University, Chandigarh	Inhibitory activity of salicylic acid derivatives against pathogenic mucorale Rhizopus arrhizus
39.	Pooja Chauhan	Department of Microbiology (Guru Nanak Dev university, Amritsar, Punjab)	Antifungal and abiotic stress tolerance properties of plant growth promoting endophytic fungus Aspergillus terreus CR7
40.	Priyanka	Punjab Agricultural University	Effect of different drying methods on the bioactive profiling of grape waste
41.	Priyanka Mankotia	Institute of Forensic Science and Criminology, Panjab University, Chandigarh	Curcumin-loaded Butea monosperma gum-based hydrogel: A new excipient for

			controlled drug delivery and anti-bacterial applications
42.	Raashi Gupta	Department of Botany, Panjab University, Chandigarh	Unraveling the complex interplay between pesticides and climate change with special reference to ecosystem health
43.	Rajat	Deaprtment of Zoology, Akal University, Talwandi Sabo, Bathinda	Taxonomic studies on insect diversity in the Ropar wetland (Ramsar site) of Punjab (India)
44.	Rakesh Meena	Department of Anthropology, Panjab University, Chandigarh	Handwritten signatures-Forensic aspects
45.	Raman Devi	Department of Zoology, Kurukshetra University, Kurukshetra	Determination of polyphenols and flavonoid content in medicinal herb Shyama tulsi (Ocimum tenuiflorum)
46.	Rigzin Chuskit	Department of Botany, Panjab university, Chandigarh	A comparative study of genuine and simulated chemical composition and antileishmanial activity of essential oil from a high-altitude herb, Heracleum pinnatum: An in vitro study
47.	Rishu	Deaprtment of Zoology, Panjab University, Chandigarh	Biosynthesis and characterization of hydroxyapatite/ collagen bio-composite derived from the fish scales of Cyprinus carpio Linn.
48.	Ritika Patial	Centre for Systems Biology and Bioinformatics, Panjab University, Chandigarh	Bioinformatics based pipeline to discover potential biomarkers and molecular pathways linking polycystic ovarian syndrome with numerous hormone imbalance disorders: A gene expression study
49.	Ritu Devi	Department of Zoology, IIHS, Kurukshetra University, Kurukshetra	Diurnal behaviour of indian flying fox Pteropus medius (Temminck, 1825) at Jyotisar in district Kurukshetra, Haryana
50.	Ritu Pal Bhura	Department of Zoology, Kurukshetra University, Kurukshetra	Primary investigations of butterfly fauna in district Kurukshetra, Haryana (India)
51.	Sachin Tayal	Centre for Nuclear Medicine, Panjab University, Chandigarh	Identifying various PET-CT associated artifacts in routine

			clinical setup to avoid false interpretation and repeated study.
52.	Sajida Banoo	Orchid Laboratory, Department of Botany, Panjab University, Chandigarh-160014, U.T.	Protocorm formation and seedling development in Habenaria plantaginea Lindl.
53.	Sathaye Shantanu Bhushan	Center of Innovative and Applied Bioprocessing (DBT-CIAB), Sector 81, SAS Nagar, Mohali	Characterization of a novel glutamate decarboxylase from kinema metagenome for gaba production
54.	Sidharth Chauhan	Department of Zoology, Panjab University, Chandigarh	Effects of ethanolic extract of Urtica ardens in aquaculture diets: Impact on excretory patterns and antioxidant systems in common carp (Cyprinus carpio)
55.	Shefali	Department of Botany, Panjab University, Chandigarh	Effect of chromium and iron on primary and secondary metabolites of Mnium cuspidatum
56.	Shikha	Institute of Forensic Science and Criminology, Panjab University, Chandigarh	Natural polysaccharides based superabsorbent hydrogels as potential dye adsorbents: A review
57.	Shubham Jattwal	Institute of Forensic Science and Criminology, Panjab University Chandigarh	Determination of lorazepam in food sample using cellulose paper sorptive extraction (CPSE) with Gas chromatography - Mass spectroscopy (GC-MS)
58.	Shrishti	Department of Botany, Panjab University, Chandigarh	Cryo-conservation of medicinal and aromatic plants using vitrification-based techniques
59.	Saurav Chauhan	School of Biological and Environmental Science, Shoolini University of Biotechnology and Management Sciences, Solan	Altitudinal impact on mycorrhizal diversity and soil properties along with Taxus contorta Griff. in the temperate forest of Shimla district
60.	Swati, Arshpreet Kaur	Department of Botany, Panjab University, Chandigarh	3-Hydroxy-3-methylglutaryl coenzyme a reductases (HMGRS): A family of

			committed enzymes in alkaloid biosynthesis in orchids
61.	Swati Gupta	Institute of Forensic Science and Criminology, Panjab University	One-pot facile synthesis of ZnO-HNT nanoparticles for adsorption of dye-pollutants
62.	Swati Prajapat	IISER MOHALI	Exploring the influence of salmonella infection on obesity/diabetes using C. elegans model
63.	Tamanna	Punjab Agricultural University, Ludhiana-141004, Punjab, India	Postharvest application of Tulsi essential oil based chitosan coating for shelf-life extension of fresh cut Guava
64.	Tania Jindal	Orchid Laboratory, Department of Botany, Panjab University Chandigarh-160014, U.T., India.	Isolation and identification of Orchid mycorrhiza
65.	Thupstan Tsewang	Department of Botany, Panjab University Chandigarh	Investigating the effect of low temperature passive storage system on physicochemical and biochemical properties in onions during harsh winter condition in Leh Ladakh.
66.	Varsha Rani	University of Lucknow, Lucknow, U.P.	Count of wading birds species from foraging sites of indian Sarus crane (Grus antigone) in Unnao, U.P.
67.	Vikas Salgotra	Department of Zoology, Sri Guru Granth Sahib World University, Fatehgarh Sahib	A cross-sectional study on the prevalence of non-communicable diseases in urban and rural areas of Punjab
68.	Yashraaj Sharma	Department of Biotechnology, Panjab University, Chandigarh	Exploration of RBOH genes in bread wheat for their role in plant development and stress response
69.	Yogesh Tomar	Department of Botany, Panjab University, Chandigarh 160 014, India	Exploring the radical scavenging and antioxidant properties of Calyptocarpus vialis L., an alien invasive weed
70.	Alka Yadav	Department of Zoology, Panjab University, Chandigarh	Toxicology screening and antileishmanial evaluation of pyrazoloquinolines: A potential drug candidates for leishmaniasis

71.	Anureet Kaur, Jaismeen Kaur	Department of Zoology, Panjab University, Chandigarh	Zooplankton: As bioindicators
72.	Anmol Balouria	Department of Zoology, DAV College Sec 10 Chandigarh	Do we really need R.O. water purifiers in Chandigarh??
73.	Avleen	GGDSD college, Sec 32, Chandigarh	Presence of acrylamide in food leading to toxicological
74.	Avinash Anand	Institute of Forensic Science and Criminology, Panjab University, Chandigarh	Empowering women through cybersecurity: Safeguarding online spaces for enhanced safety
75.	Deepti Jaswal	Punjab Agricultural University, Ludhiana-141004, Punjab, India	Characterization of industrial potato mash waste for production of value-added product
76.	Devlina Saha	Centre for Stem cell and tissue Engineering, Panjab University, Chandigarh	Cancer progress, from preinvasive to invasive stage, immune cells evolution and detection
77.	Garima	Department of Biochemistry, Panjab university, Chandigarh	To evaluate the beneficial potential of oleanolic acid against acid aspiration mediated acute lung injury in mice
78.	Gurnemat Kaur, Yuvika Khanna	Khalsa College for Women, Civil Lines, Ludhiana	Concept of urban greening - A boon for health
79.	Gurnoor Kaur	Department of Botany, Mehr Chand Mahajan DAV College for Women, Sector 36-A, Chandigarh	Heavy metal toxicity in plants: An overview
80.	Jayansh	Department of Biotechnology, DAV College, Sector 10, Chandigarh	Anti-pathogenic activity of FDA approved quercetin against PPK of E. coli: A molecular docking approach
81.	Komal Sharma	Orchid Laboratory, Department of Botany, Panjab University, Chandigarh	Importance of molecular markers
82.	Loveneesh Puri	Department of Zoology, Panjab University, Chandigarh	Food and nutrition - A perspective on women's health

83.	Mrigha Kalra	Department of Zoology, Panjab University, Chandigarh	Bee-washing - An another way of green-washing
84.	Muskan, Sarvjeet Kaur	Department of Botany, Panjab University Chandigarh	Role of artificial intelligence in agriculture
85.	Nikhil Prasad	Department of Zoology, DAV College Sec-10 Chandigarh	Caution packaged drinking water
86.	Shreya Kaushal	Centre of stem cell and tissue engineering, Panjab University, Chandigarh	The age-defying potential of stem cell research
87.	Urvashi Dangi	Centre of stem cell and tissue engineering, Panjab University, Chandigarh	Applications of selenium nanoparticles
88.	Yashreet Kaur Basra	Stem Cell Tissue Engineering, Panjab University, Chandigarh	Stem cells as regenerative medicine for neural disorders

PP1. LANGUISHING - A RECENT PERSPECTIVE

Harpriya Singh[1]

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ABSTRACT

The 21st century has been hailed as a century of stress and it has impacted everyone's life. While the goal of human life is thriving, yet one can witness humanity sinking into Languishing. Post COVID, the concept of Languishing has received a lot of attention. Languishing is relatively a new concept which is defined as a state in which an individual is devoid of positive emotion toward life, and is not functioning well either psychologically or socially, and has not been depressed during the past year. Languishers are neither mentally ill nor mentally healthy. Languishing is the lack of meaning, purpose or belonging in life, which leads to emptiness, lack of emotion and stagnation. Languishing is not depression or sadness, but rather "the absence of feeling good about your life." Languishing is the absence of mental health. It is characterized by dissatisfaction, lack of engagement, and apathy. Previous worker emphasizes that mental health is seen on a spectrum from depression to flourishing, Flourishing is the peak of well-being where one has a strong sense of meaning and mastery to others. Depression is the valley of ill-being where one feels drained and worthless. Languishing is the neglected middle child of mental health. It's the void between depression and flourishing- the absence of well-being. It's a feeling of 'blah', a feeling of stagnation and emptiness. The present paper aims to understand the concept of Languishing and diverse research findings related to the same.

PP2. AMELIORATING POTENTIAL OF B-PINENE STUDIED AT ANATOMICAL AND CYTOLOGICAL LEVEL IN CHROMIUM AFFECTED PLANTS

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ABSTRACT

Improper disposal of industrial effluents and ever-increasing demand of heavy metals (HMs) for large scale industries are responsible for deterioration of agricultural land. Heavy metals are marked as hazardous compounds which when accumulated in the environment imparts havoc to the mankind. Chromium (Cr) has been categorized under the 20 topmost hazardous materials specified by the Agency for Toxic Substances and Disease Registry. Chromium discharge, predominantly through anthropogenic activities including leather tanning, electroplating, textile dyeing, paper production, metal extraction, pollutes both soil and water. Naturally, Cr enters the food chain through weathering of Cr containing rocks and their leaching into the aquatic bodies ultimately reaching the agricultural land. Observing the importance of Cr metal in our day-to-day life, it is crucial to explore cost-effective and eco-friendly strategies to mitigate the obnoxious effects of Cr in plants. Although, earlier attempts have been made to manage the toxicity imposed by Cr in plants, yet their effectiveness in terms of cost, labor and nature-friendly is lacking. It was hypothesized that β-pinene (non-oxygenated monoterpene) – a natural plant product, ameliorates the toxic effect of Cr (VI) in

Zea mays without imposing any threat to plants. In the present study, β-pinene (10 µM) was observed to ameliorate the toxicity induced by Cr (VI) (250 µM) in *Z. mays* plants as there was marked improvement in the root anatomy of *Z. mays* as well as reduction in the chromosomal aberrations in onion root cells.

PP3. EFFECT OF SALT STRESS ON GERMINATION DYNAMICS AND SEEDLING DEVELOPMENT IN CHICKPEA GENOTYPE

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[1]*Department of Botany, Mehr Chand Mahajan DAV College for Women, Chandigarh*

ABSTRACT

Seed germination and early seedling growth are crucial for plant establishment and production, particularly under saline conditions. *Cicer arietinum* L. (chickpea) is a leguminous crop, grown in arid and semiarid regions of the world, which are affected by salt stress. The present study was conducted with the aim of studying the effect of NaCl stress on seed germination and seedling growth of the chickpea genotype under varying saline conditions (0 – 100 mM). Results indicated that increasing levels of salt inhibited seed germination percentage, germination vigor index, shoot length, root length, and seedling dry weight correlated negatively with enhanced levels of malondialdehyde, and hydrogen peroxide levels, thus causing oxidative stress.

PP4. CULTURE INDEPENDENT ASSESSMENT OF SOHNA GEOTHERMAL SPRING

Navneet Batra[1], Abhinashi Singh Sodhi[1], Sonu Bhatia[1]

[1]*GGDSD College, Sector-32, Chandigarh*

ABSTRACT

Geothermal springs are unique source of hot groundwater with a temperature ranging between 36˚C- 250˚C and rich in different macro and microelements including calcium, chloride, magnesium, potassium, sodium, sulphates. These habitats are known for their religious and scientific significance thus making them an important source for scientific research and and medical travel. Metagenomic studies and next generation sequencing (NGS) has brought a radical change in the field of science to study structure and function of entire genetic material obtained from environmental sample of these hot springs, without the prior need for growing cultures. In the present study water and soil samples namely, SS1, SS2 and SW were collected from hot spring site situated in Sohna, Gurugram, Haryana. Metagenomic DNA of three samples SS1, SS2 and SW were amplified followed by next generation sequencing. Phylum level taxonomic analysis of sample SS1 showed bacterial distribution with dominance of *Proteobacteria* followed by *Actinobacteria* and *Firmicutes*. Similar trend was observed in sample SS2 whereas SW was dominated by *Proteobacteria* and *Firmicutes* followed by *Bacteroidetes* and *Actinobacteria*. Sample SS1 and SS2 also showed presence of Verrucomicrobia, Nitrospirae and Chloroflexi whereas water sample SW with cyanobacteria and Acidobacteria. Genus level taxonomic analysis revealed the significant presence of genera Brevundimonas in sample SS1, SS2 and SW.

PP5. HOW RISING TEMPERATURE IS AFFECTING THE FOOD SECURITY?

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ABSTRACT

The Earth's temperature is projected to rise from 2.5°C to 4.5°C by the year 2100, a trend that will have a significant impact on global agricultural crop yields. Numerous studies have investigated the intricate relationship between increasing global temperature and its implications for food security, both on a global scale and within the specific context of India. Plants possess an optimal temperature range for growth, beyond which they experience heat stress, resulting in harmful cellular damage. Elevated temperatures can exert substantial effects on various aspects of plant growth, development, and functionality, ultimately influencing the overall plant productivity. With the world's population expected to reach 10 billion by 2050, humanity is facing the growing challenge of addressing the dual burden of food insecurity and malnutrition. Effectively addressing this challenge will necessitate a substantial increase in global food production. Notably, wheat, maize, and rice are major crops that play a pivotal role in ensuring global food security, collectively providing a minimum of 30% of the food calories consumed by over 4.5 billion people in 94 developing countries. Various crucial tools, such as crop simulation models, are promising for assessing the potential consequences of climate change on crop production. These models can aid in crop improvement programs by identifying appropriate future crop management practices. The present and forthcoming challenges emphasize the critical importance of addressing climate change as a fundamental component in securing both global and Indian food security.

PP6. PATTERNS AND DETERMINANTS OF PLANT SPECIES RICHNESS ALONG AN ELEVATIONAL GRADIENT IN WESTERN HIMALAYAS

Abhishek Kumar[1], Meenu Patil[1], Pardeep Kumar[1], Anand Narain Singh[1]
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ABSTRACT

Understanding species distribution patterns is crucial for biodiversity conservation and management. While the evidence for elevational patterns in species richness is widespread, underlying causes and mechanisms remain poorly understood. This study aimed to investigate patterns and determinants of plant species richness along elevational gradients in the Western Himalayas. We prepared a comprehensive database of the elevational distribution of 1150 plant species by combining information from field visits and published literature. To elucidate species richness patterns along elevational gradients, we used rigorous statistical analyses and null model simulations. We used the structural equation modelling framework to identify the direct and indirect effects of climatic factors on species richness. Our study revealed variable linear to non-linear elevational patterns of plant species richness, which showed substantial

deviations from the predictions of the mid-domain effect null model. Climatic factors, rather than topographic heterogeneity, emerged as primary determinants of elevational species richness. The direct effects of climatic variables were more substantial than their indirect effects. In conclusion, our study showed that variable species richness patterns are shaped by direct and indirect effects of climatic variables at broader spatial scales. Species richness is shaped by climatic tolerances rather than habitat diversity at larger scales. This knowledge can aid in predicting and managing the impacts of ongoing environmental change on elevational biodiversity.

PP7. PLANT ESSENTIAL OILS AS PROMISING BIOPESTICIDES FOR FUTURE

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[1]*Department of Botany, Panjab University, Chandigarh*

ABSTRACT

The current overuse of synthetic chemicals has adverse impacts on both the environment and human health. To overcome this problem, plant-based products can be one of the possible solutions that are biodegradable and hence environmentally-safe. Plants are the repositories of natural compounds like phenols, oils, tannins, terpenes, alkaloids etc. that provide enormous services to us. Among these, the plant essential oils (PEOs) representing mixtures of volatile constituents that are biologically very active. These occur in special secretory cells of different organs of the plant, such as roots, stem, leaves, seeds, flowers, bark, or wood etc. PEOs exhibit many biological activities such as antibacterial, antifungal, antioxidant etc., which have attracted the attention of researchers in recent years. Their use as biocontrol products or pesticides is being widely explored. Several modern techniques like nanotechnology, bioinformatics and recombinant DNA technology are being used to enhance both the quality and quantity of these oils. It is expected that the improved next-generation biopesticides based on the essential oils will find extensive use in the degrading agroecosystems and help restoring them in a sustainable way.

PP8. EXPLORING THE POTENTIAL OF FORENSIC GENETIC GENEALOGY IN IDENTIFICATION

Akansha Rana[1], Kewal Krishan[2]

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ABSTRACT

Forensic genetic genealogy (FGG) has emerged as a transformative tool in criminal investigations, revolutionizing the field of forensic science. FGG holds a great promise for continued advancements in criminal investigations and ultimately ensuring a safer society. The amalgamation of forensic genetics, genetic genealogy and forensic anthropology research has appeared as the emerging sub-discipline within forensic science. Utilizing FGG helps identify unknown people, particularly those who have been lost or unidentified for a long time, and not only helps solve cold cases. FGG enables law enforcement agencies to solve previously unsolvable crimes, mass disasters, and identify perpetrators with unprecedented

accuracy based on fingerprint analysis, traditional forensic DNA analysis with genealogical research and advanced DNA sequencing technologies, The investigative process begins by generating a DNA profile from the crime scene evidence, which is then uploaded to online databases, such as Family Tree DNA, to find potential genetic matches. Next, genealogists build family trees using various public records, family histories, and other genealogical resources, narrowing down potential suspects until a definitive match is found. Its use has successfully connected offenders to instances spanning several jurisdictions and decades, assisting in bringing justice and closure to victims and their families. The present communication highlights the various advancements associated with the FGG as well the case studies which have been solved using FGG. Moreover, this communication also discussed the limitations and ethical considerations associated with the forensic genetic genealogy.

PP9. UNRAVELING ALLOSTERIC MECHANISMS GOVERNING BACTERIAL TRANSCRIPTIONAL REPRESSION IN SUGAR ACID METABOLISM

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ABSTRACT

In this study, we embark on a detailed investigation into the structural and functional dynamics of the DgoR, transcriptional repressor of *E. coli* that regulates the metabolism of D-galactonate. Through random mutagenesis-based genetic screening, four DgoR superrepressors have been identified: A97V, S171L, T180I, and M188I. We built a functional dimer model of DgoR bound to DNA and docked with D-galactonate, establishing a foundational structural framework for further analyses. Notably, these mutations are located proximally to the D-galactonate-binding cavity, implicating their potential roles in effector-binding pathways and resulting in allosteric regulation of the DNA-binding domain. To elucidate the underlying allosteric mechanisms and stability dynamics of the DgoR domain, we performed unbiased, long-scale molecular dynamics simulations. Our primary focus is on assessing the impact of these four mutations, alongside the wild-type (WT) DgoR, on its stability and dynamics. This investigation sheds light on the mechanistic aspects of DgoR, which employs an induced-allosteric mechanism to facilitate DNA release upon effector binding. Given the tight coupling between allostery, effector recognition, and transcriptional response, our findings hold promise for the development of innovative allosteric transcription factor-based biosensors and provide valuable insights into their design.

PP10. EDNA: NON-INVASIVE MOLECULAR TOOL FOR WILDLIFE MONITORING PURPOSES

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ABSTRACT

Environmental DNA (eDNA) has emerged as an efficient method for non-invasive monitoring of wildlife species. eDNA is a relatively new technology that has the potential to be a rapid,

non-invasive, non-laborious and cost-effective tool for monitoring wildlife species and biodiversity studies. eDNA can be extracted from a wide range of samples including sediment, water and air. eDNA based methods can complement and overcome the limitations of the conventional surveying methods for monitoring wildlife species at greatest rate. Thus, helping the regulating authorities to take prompt actions. eDNA isolated from the environment samples are amplified with species-specific primers of invasive alien species and sequenced to generate thousands to millions of reads. Therefore, this technique will be a potent tool for wildlife monitoring. This will improve our capacity to efficiently monitor, detect and control endangered or elusive wildlife species, aiding in the conservation of wildlife ecosystems.

PP11. PRELIMINARY INVESTIGATIONS ON AVIFAUNAL DIVERSITY OF MANGAR BANI FORESTS IN ARAVALLI RANGE, FARIDABAD, HARYANA

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ABSTRACT

Mangar forest is situated on the western edge of the Mangar village district Faridabad, Haryana. It is surrounded by hills that go up to the height of maximum 300 m and covers an area of 2.66 sq. km. It is part of a large contiguous stretch of the Aravalli Forests stretching approximately 30 km south-north from Sohna in Haryana northwards to Tughlaqabad in Delhi. Periodic monthly field visits were made to the study area from September 2022 to August 2023 by using various techniques such as scan sampling and point-and-line transect count. A total of 103 bird species were recorded belonging to 74 genera, 47 families, and 15 orders during the study period. Order Passeriformes was most diverse in the study area. Feeding guild results indicate that insectivores are the dominant ones. As per the IUCN Red List criteria, 100 bird species were classified as least concern (LC), whereas 2 bird species were classified as Near Threatened (NT) i.e., Darter, Alexandrine Parakeet and one avian species was classified as Endangered (EN) i.e., Egyptian Vulture. Analysis of IUCN population trend shows that 24 bird species having increasing population trend, 21 species having decreasing population trend, 47 species having stable population trend, and 11 species are still with unknown population trend globally. Study results revealed that Mangar Bani is a significant nesting habitat for some rare summer visitors such as Indian Pitta and Indian paradise flycatcher. As the study area hold significant role in birds' diversity, it needs to be conserved.

PP12. EPILACTOSE BIOSYNTHESIS USING NOVEL CELLOBIOSE 2-EPIMERASE VARIANT FROM THE GEOTHERMAL METAGENOME OF CHHATTISGARH

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ABSTRACT

Lactose is one of the main components of milk made up of glucose and galactose. Approximately 65% of the global population is lactose intolerant. Lactose intolerance causes problems like bloating, diarrhea, gas, nausea, and pain in the abdomen. But this lactose can be transformed into a prebiotic molecule like epilactose. Epilactose is a disaccharide comprised of galactose and mannose. It is a non-digestible carbohydrate and has a role in promoting intestinal mineral absorption like Ca, Mg, and Fe. It has prebiotic properties of stimulating the growth of the gut probiotic population. Epilactose has applications in treating postgastrectomy osteopenia and anemia by promoting calcium and iron absorption. Cellobiose 2-epimerases (CE) are interesting enzymes that can catalyze the production of lactose-based prebiotics. Genome mining Chhattisgarh geothermal metagenome was mined using BlastX for cellobiose 2-epimerase screening. This is the first work reporting the cellobiose 2-epimerase gene from metagenomic resources. The nucleotide sequence of the CE had an ORF of 1207bp encoding protein of 401 amino acids. The purified enzyme had a molecular mass of 40kDa. The catalytic property of the recombinant enzyme was extensively studied. The optimum temperature and pH of the enzyme were 60°C and 6.0, respectively.

PP13. BIOCHEMICAL PROFILING, ANTIOXIDANT AND ANTIMICROBIAL ACTIVITIES OF THYSANOLAENA LATIFOLIA (ROXB. EX HORNEM.) HONDA COLLECTED FROM COLD DESERT REGION OF HIMACHAL PRADESH, INDIA

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ABSTRACT

Thysanolaena latifolia (Roxb. ex Hornem.) Honda is a perennial plant of the family Poaceae that resembles the bamboos. It is commonly named as a Tiger Grass, Broom Stick, Broom Grass, etc. It is native to Bangladesh, Bhutan, Cambodia, China, India, and Indonesia. It grows on the slopes of steep hills and even on the sandy banks of rivers. Decoction of this plant is commonly used against many diseases by the ethnic groups of India.The bioactive compound present in shoots and leaves of *Thysanolaena latifolia* determined by GC-MS analysis has also been tested for its antioxidant and antimicrobial properties. Free radical scavenging was assayed for antioxidant activity against DPPH (1, 1-Diphenyl-2- Picrylhydrazyl).The minimum inhibitory concentration of crude methanol extract of plant samples was determined through Resazurin assay against five bacterial strains namely, *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Pseudomonas areuginosa* pro-1, *Pseudomonas areuginosa* pa-14 and *Escherichia coli*. The antimicrobial activity of plant sample extracts was also validated

through growth inhibition assays. Overall results, thus, corroborated the medicinal relevance of plant *Thysanolaena latifolia* for its wider applications by the ethnic groups especially for its anti-oxidative and antimicrobial nature.

PP14. BITE MARKS: EVIDENCE OR A MISLEAD – CASE STUDIES OF EXONERATION OF WRONGFULLY CONVICTED PEOPLE BY A LEGAL INITIATIVE CALLED "INNOCENCE PROJECT"

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ABSTRACT

Bite mark analysis is one of the aspects of forensic odontology where Forensic Scientist matches the bite mark found on the victim's body with the dental impressions of suspects. In the past, bite marks were very well-received evidence in Forensic Investigations. Many questions were answered with the help of bite marks in Forensic Investigation viz., is it a bite mark? is it a bite mark of human or animal? is it self-harmed or inflicted by others? are the biter's teeth dimensions like the dimensions of the bite mark? is it a bite mark or a love bite? However, their reliability and scientific validity recently in a judicial proceeding is questionable after the exoneration of wrongfully convicted people categorized by the Innocence Project. The Innocence Project, 1992, by Cardozo Law School in New York works to free the innocent convicted people by examining DNA samples and other scientific advancements. There were several cases in the United States, where defendants were found guilty based on bite marks examination and were later acquitted. DNA analysis in Innocence Project suppressed the false justice given by bite mark evidence. This communication enlightens the potential of linking bite marks to the suspect and represents case studies of the Innocence Project where people were convicted based on bite marks and acquitted later.

PP15. ARTIFICIAL INTELLIGENCE IN AGRICULTURE

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ABSTRACT

According to John McCarthy (AI's father), Artificial Intelligence (AI) is ''the scientific and technological understanding of building smart computer programs." Agriculture is one of the oldest and most important industries in the world. As the world population continues to grow, it is essential to improve agricultural methods and aim to innovate new approaches to enhance agricultural practices. In the past decade, farming has only been limited to food and crop production but now it expanded to processing, production, and marketing. The entry of AI into agriculture will be possible through various technological advancements such as big data analytics, robotics, the Internet of Things (IoT), sensors and cameras, drones, and wide- scale internet coverage on remote agricultural fields. Furthermore, AI tools such as machine learning, computer vision, and data analytics give incredible flexibility and adaptability to farmers. Agriculture faces many challenges, such as crop management, improper soil

treatment, disease, pest infection, and irrigation, which result in severe yield losses along with environmental hazards. Thus, AI has revolutionized farming practices by offering solutions for crop health management, pest control, soil analysis, and data-driven decision- making throughout the food supply chain. It helps farmers with precision farming produce more with fewer resources, increase crop quality, and facilitate the rapid delivery of agricultural products to the market. It also provides data on weather forecasts that aid farmers in choosing the best time to sow seeds. This poster presents a literature survey on the application, limitations, and future aspects of artificial techniques in agriculture.

PP16. GC-MS ANALYSIS AND ANTIMICROBIAL ACTIVITY OF METHANOL EXTRACT OF ISOPTERYGIUM ALBESCENS

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ABSTRACT

Mosses have been neglected as a study subject for a long time. Recent research shows that mosses contain remarkable and unique substances with high biological activity. The aim of this study, accordingly, was to analyze the composition of moss and to screen their antimicrobial activity. Using sophisticated techniques, the methanol extract was subjected for GC-MS chemical analysis of plant carried out to trace the potential chemical content with respect to future elucidation of compounds for pharmacology. The plant extract in methanol were tested against different gram positive and gram negative and bacterial and fungal strains for antimicrobial sensitivity test.

PP17. OVEREXPRESSION, PURIFICATION AND UNFOLDING STUDIES ON A METAGENOMIC LIPASE

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ABSTRACT

A metagenomic derived lipase (LipR1), extracted from hot springs was earlier cloned and characterized. The polypeptide consists of 388 amino acids with apparent molecular weight of 43kDa. This enzyme despite sharing high degree of sequence identity with known thermophilic lipase turned out to be mesophilic enzyme. This proved to be a good model to investigate sequence-structure-function relationship. In the present study, we have overexpressed the recombinant protein, LipR1, in *E.coli* and purified the protein using affinity chromatography. In order to study the unfolding behavior of LipR1, urea and guanidium chloride induced equilibrium unfolding of LipR1 was studied with the help of fluorescence spectroscopy and circular dichroism (CD). We also carried out thermal unfolding of LipR1. Changes in intrinsic tryptophan fluorescence were monitored as a function of increasing concentration of chemical denaturants (Urea and GdnHcl) and temperature. To investigate structural changes during equilibrium unfolding of LipR1, we also carried out 1-anilino-8-napthalene sulfonic acid (ANS) binding studies. The chemical and thermal denaturation

profiles of LipR1 obtained from fluorescence spectroscopy and far- UV CD suggest a two-state transitions or biphasic nature of unfolding in case of LipR1.

PP18. ANALYZING THE TOXICITY POTENTIAL OF P-CHLOROANILINE IN LIVER AND GILL OF CHANNA PUNCTATUS USING DIFFERENT GENOTOXIC AND BIOCHEMICAL MARKERS

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ABSTRACT

Chlorinated substituted aniline such as 4-chloroanline or p-chloroaniline is widely used as intermediates in many different fields of applications, such as the production of isocyanates, rubber processing chemicals, dyes and pigments, agricultural chemicals and pharmaceuticals. Further these can be released into the surface water as industrial effluents or as break-down products of pesticides and dye. Additionally, they may be discharged into surface water as industrial effluents or as pesticide and dye breakdown products. When exposed to the environment, the carcinogenic qualities of p-chloroaniline could harm aquatic life as well as human life. Two concentrations (1/4 LC50 and 1/2 LC50) of p-chloroaniline were chosen for the current study after the LC50 for this compound was established. The health condition of fish exposed to m-chloroaniline after 96 hours was assessed using the levels of reactive oxygen species (ROS) and antioxidant enzymatic activities (superoxide dismutase (SOD), catalase (CAT), and glutathione-S-transferase (GST) in the liver and gill of Channa punctatus. To gauge the rate of lipid peroxidation in the exposed organs, MDA levels were also assessed. Determinant effects of toxicants are shown by time- and dose-dependent changes in the levels of various biochemical components in both liver and gill tissues. After 96 hours, tailDNA and the olive tail moment were measured in the liver and gill of *Channa punctatus*, whilst the genotoxicity was assessed using the comet assay. In fish subjected to p-chloroaniline, an increase in the values of the measured parameters tail DNA and olive tail moment indicates DNA damage.

PP19. DIVERSITY OF AVIAN TROPHIC GUILDS IN RELATION TO HABITAT HETEROGENEITY AT VILLAGE PONDS

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ABSTRACT

Avian species form an integral constituent of animal diversity inhabiting village ponds in agro ecosystem. Bird diversity, composition and their foraging guilds were noted with respect to heterogeneous pond habitats during the monsoon season from July 2022 to October 2022. Three village ponds were selected namely Dhaipai (pond A), Khandoor (pond B) and Mansuran (pond C) in district Ludhiana. Line/point transect methods were followed to record avian diversity. A total of 28 bird species belonging to 11 orders were recorded; species richness values were 28, 23 and 18 at village ponds A, B and C respectively. Tree diversity comprised of 16, 6 and one tree species at ponds A, B and C respectively. Habitat features of

selected ponds were different from each other, pond A was having cemented boundary wall surrounded by crop fields, pond B having good water quality with tree diversity and pond C having floating aquatic vegetation (6 weed species). Overall, 12 avian trophic guilds consisting of 7 purely insectivorous, 5 insectivorous /granivorous, 3 insectivorous/ soil invertebrate / small vertebrate feeders, 2 species each of insectivorous /soil invertebrate feeders, insectivorous / small vertebrate feeders, granivorous, insectivorous/ soil invertebrate/granivorous / plant feeders and 1 species each of soil invertebrate feeder, frugivorous/ plant feeder /granivorous, insectivorous/ plant feeder / frugivorous, small vertebrates / plant feeder, omnivorous / scavenger were observed. Findings illustrate that variable habitat features both vegetation and landscape as potential key elements determining diversity of specialized avian feeding guilds comprising of trophic levels in interconnected food web.

PP20. MANIPULATION OF FIELDS RATS BEHAVIOUR USING REPELLENT BASED FORMULATION AND ITS PRACTICAL APPLICATION IN CROP FIELDS IN INTEGRATION WITH TRAPPING FOR RODENT PEST MANAGEMENT

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ABSTRACT

Fodder crops serve as reservoir crops to the rats and provide protected and undisturbed habitat to animals. By managing rats in small pockets of these crops, we can also control rat damage in the surrounding crop fields. During the present study, repellent based formulation (RBF) developed and tested in our laboratory against rodents' pests was validated for its efficacy either alone or integration with trapping in bajra crop fields of district Ludhiana. Rodent population was estimated by different census methods throughout the crop period to determine the critical stage of rodent management as well as before and after treatment to calculate rodent control success. Results revealed a significant increase in rodent population with crop maturity, which might be due to the increased hiding space and harvesting of surrounding maize crop fields in April. All the active burrows were fumigated with RBF in the first week of May. Along with these few pouches were also tied on sticks outside the burrows. After few days of treatment, rats started moving out of the treated fields and entered in surrounding fields. Trapping of rodents resulted in significant reduction in burrow count in surrounding fields. Results also indicated increase in trapping efficacy, when RBF was integrated with trapping as compared to when trapping was done alone. Overall, results indicated that integration of RBF with trapping in surrounding fields reduced rodent infestation (65.8 to 97.6%) in both RBF treated bajra fields and in surrounding maize fields for upto 30 days.

PP21. ANTIOXIDANT AND PHYTOCHEMICAL PROFILING OF MEDICINAL SPICE (CINNAMON ZEYLANICUM) BY USING SOLVENTS OF DIFFERENT POLARITY

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ABSTRACT

Cinnamon is a type of condiment being used by different civilizations around the world. *Cinnamon zeylanicum* (CZ) is a tropical evergreen plant found in Sri Lanka and southeast areas of India. *Cinnamon zeylanicum* belongs to the family Lauraceae, is widely used in Ayurvedic medicine and as a flavouring agent in food. In the present study *Cinnamon zeylanicum* bark was purchased from FSTL (Flavourit Spices Trading Limited), Cochin, Kerala, India. The bark of *Cinnamon zeylanicum* were extracted in 50% methanol (CzM) and sequentially fractionated with n-hexane (CzH), ethylacetate (CzE) and butanol (CzB) to find the best extraction solvent for antioxidants from the spice known for its medicinal values. For analyzing antioxidant activities free radical DPPH (2,2-diphenyl-1-picryl-hydrazyl-hydrate) scavenging, anion radical ABTS (2,2'-azino-bis(3-ethylbenzothiazoline-6-sulfonic acid) scavenging and Ferric ion reducing power were analysed. DPPH ABTS, and FRAP assay results for various solvents of cinnamon extract suggest that butanol is better solvent than methanol and ethyl acetate, as IC50 of butanol was much lower than methanol and ethyl acetate. Butanol fraction was rich in flavonoid and polyphenol content than methanol and ethy acetate fraction. It suggests that butanol is better solvent than other solvents.

PP22. LECTINS IDENTIFIED FROM ABELMOSCHUS ESCULENTUS

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ABSTRACT

Two lectins have been isolated from *Abelmoschus esculentus*. Using SDS-PAGE analysis, the molecular weight of 21 KDa and 10 KDa of proteins were confirmed. Both proteins were showing hemagglutination activity. Sugar specificity of proteins were checked using hemagglutination assay and florescence studies. It was seen that 21 KDa protein was showing specificity with lactose and galactose and the 10 KDa protein was showing specificity with mannose. Trypsin inhibitory activity of 21 KDa protein has been confirmed through BAPNA assay. We have also collected the information of lectin proteins which were showing trypsin inhibitory activity using uniport.

PP23. GC-MS ANALYSIS OF BIOACTIVE COMPOUNDS FROM METHANOLIC EXTRACT OF FORMULATION USED AGAINST SNAKEBITE

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ABSTRACT

This study focuses on the formulation that has been utilized by the local community as an initial remedy for snakebite incidents. Employing GC-MS methodology for extract analysis serves as a valuable means of identifying bioactive compounds in various formulations. The primary objective of this research was to use Gas Chromatography-Mass Spectrometry (GC-MS) for the identification of the bioactive constituents in the methanolic extract formulated for treating snakebites. The GC-MS analysis unveiled the presence of several compounds within the formulation, including 9,12-Octadecadienoic acid (Z, Z), Diepicedrene-1-oxide, Undecanoic acid, and cis-13-Octadecenoic acid. As a result, it is reasonable to assume that the formulation may harbor potential properties like anti-inflammatory, antioxidant, and antifungal effects. Furthermore, it could be effective in mitigating lipolysis induced by snake venom due to the presence of some secondary metabolites. These findings support to the utilization of this formulation in snake envenomation cases. Further research efforts focused on isolating and elucidating the mechanisms of action of these active principles may yield valuable insights for managing snakebite cases effectively.

PP24. MORIN AS A THERAPEUTIC INTERVENTION FOR GESTATIONAL STRESS-INDUCED GUT ABERRATIONS IN THE F1 GENERATION

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ABSTRACT

Maternal psychophysical stress during pregnancy can influence the well-being of the next generation. In our investigation, we delved into how maternal stress affects the F1 generation, scrutinizing a range of bodily functions. Our investigation unveiled that maternal psychophysical stress disrupted the delicate balance of antioxidants, stirred up excessive activity in the gut, leading to heightened gut motility, and raised the water content in fecal matter, indicating digestive irregularities. Moreover, gestational stress also increased the permeability of the gut by weakening the gut-blood barrier, shielding the normal functioning of the gut in F1 offspring. These signs hinted towards widespread oxidative stress mediated gut aberrations leading to irritable bowel syndrome (IBS) like symptoms. Remarkably, our study also ventured into the potential healing powers of morin, a naturally occurring compound derived from plants. It is recognized for its antioxidant and anti-inflammatory properties. Our observations demonstrated that administering morin effectively mitigated the abnormalities caused by maternal stress in the F1 generation. Morin intake restored the equilibrium of antioxidants, normalized gut activity, reduced fecal water content and protected the integrity of the gut-blood barrier. These findings underscore the far-reaching consequences

of maternal psychophysical stress on the health of offspring, impacting crucial areas such as antioxidant defenses, gastrointestinal functions, and protective barriers. Furthermore, the promising therapeutic potential of morin emphasizes its value as a natural intervention to counteract the adverse effects of gestational stress on the gut health of offspring, offering new avenues for prevention and treatment in the realm of maternal stress-related health challenges.

PP25. EXPLORATION OF GLUTATHIONE REDUCTASE AND MONODEHYDROASCORBATE REDUCTASE GENES OF BREAD WHEAT

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ABSTRACT

Plants protect themselves against ROS induced oxidative damage by the upregulation of antioxidant machinery. Out of many components of antioxidant machinery, glutathione reductase (GR) and monodehydroascorbate reductase (MDHAR) play a vital role in detoxifying ROS. In our study we have identified 7 and 14 genes of GR and MDHAR respectively. The phylogenetic study of TaGR and TaMDHAR proteins revealed their clustering into different groups based on their sub-cellular localization. Protein structure analyses exposed the occurrence of Pyr_redox conserved domain of the pyridine nucleotide disulfide oxidoreductase family which is important for their catalytic mechanism. The promoter analyses of TaGR and TaMDHAR genes predicted the occurrence of cis-regulatory elements related to growth and development, light, phytohormones, and stress and hence, signifies their role in both development and stress responses. The expression analyses via transcriptomic data suggested the participation of these genes in vegetative and reproductive development, abiotic and biotic stress responses. The qRT-PCR and enzyme assay under drought, heat and salt treatments further confirmed their role in abiotic stress tolerance. The protein-protein and protein-chemical interaction analyses with other antioxidants and chemical molecules related to ascorbate-glutathione cycle exposed their synchronized functioning. The miRNA and transcription factor interaction study further pointed their functions in developmental processes and stress responses. Moreover, the functional characterization of TaGR2-D gene has been performed in Saccharomyces cerevisiae under different abiotic stress conditions. This study gives extensive and substantial information about the importance of GR and MDHAR in stress responses, which might be use.

PP26. FROM STREAMS TO PLATES: THE PERILS OF HEAVY METAL TOXICITY IN EDIBLE FISH

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ABSTRACT

The present study aims to investigate the concentration of heavy metals (Zn, Fe, Mn, Cd, Ni, Co, Cr, As, Pb, Co) in the muscle of commercial fish i.e., *Labeo rohita* being caught at Harike

wetland. The results of this investigation showed that, general pattern of heavy metal concentrations in the muscle of *L. rohita* were in the order of As (251.54) > Fe (223.80) > Zn (114.14) > Cr (29.99) > Pb (25.93) > Cu (24.91) > Ni (7.77) > Mn (6.04) > Co (3.01) > Cd (0.34) (mg/kg/bwt/day). Amongst various heavy metals studied, As was maximum, while Cd was minimum. It was also found that the EDI (Estimated Daily Intake) of all the heavy metals studied i.e. As, Cd, Cr, Cu, Fe, Mn, Ni, Pb and Zn were greater than the PTDI (Provisional Tolerable Daily Intake) values prescribed by FAO. It may therefore be concluded that *L. rohita* in the study undertaken is not fit for human consumption. THQ (Target Hazard Quotient) of each As, Zn and Cr have values > 1 which indicates health risks for humans by consuming *Labeo rohita* from Harike wetland, Punjab.

PP27. ANTIBACTERIAL ACTIVITY OF PHYTOCOMPOUNDS OF THE PLANT TRIBULUS TERRESTRIS AGAINST E. COLI: IN-SILICO APPROACH

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ABSTRACT

E. coli is gram-negative, friendly, facultative anaerobic bacteria commonly found in the lower intestine of warm-blooded organisms, sometimes it causes diarrhea and stomach cramps. Enterohemorrhagic *E. coli* attaches via intimin protein and produces a poison called Shiga toxin. It causes bloody diarrhea, sometimes damages the kidney, and progresses to the potentially fatal hemolytic uremic syndrome (HUS). *E. coli* is used as standard bacteria to check antibacterial properties as any drug that can kill *E. coli* can also be used to kill other harmful gram-negative bacteria. Since the beginning of human history, medicinal plants have been a plentiful source of nutrients for healing. Medicinal plants have the potential to be used as a therapeutic agent. *Tribulus terrestris* is utilized either singly as a single medicinal agent or as the primary or secondary ingredient in numerous chemical formulations and dietary supplements. Thirty phytochemicals from *Tribulus terrestris* was retrieved and molecular docking was performed against the 5V7A protein of *E. coli* and compared with a reference drug named ciprofloxacin. Sixteen of them exhibited lower binding energies than the reference drug. Tigogenin exhibited the strongest binding energy and the most stable association when compared to the other drugs examined. The goal of the current work is to examine the antibacterial activity of *Tribulus terrestris* against *E. coli* using in-silico methods.

PP28. 24-EPIBRASSINOLIDE MODULATING PHYSIOLOGY AND GROWTH CHARACTERISTICS OF CADMIUM STRESSED SOYBEAN [GLYCINE MAX (L.) MERR.]

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ABSTRACT

Due to hydrophilic nature and high solubility of cadmium, it is absorbed through soil rhizosphere and accumulate over a period in the plants. Various anthropogenic activities are

continuously adding up to its level in the atmosphere challenging the crop system, productivity and, results in related human health hazards. Present study was aimed at studying the role of 24-epibrassinolide (EBL) in neutralizing Cd caused oxidative stress by modulating physiology and growth attributes in soybean [*Glycine max* (L.) Merr. cv. SL688]. Seedlings grown in the open growth house were subjected to heavy metal Cd (200-600µM) at 15d interval after seed sowing along with foliar application of EBL (1or 3 µM) in combination. A significant decline in the leaf pigments such as chlorophyll, carotenoids, relative leaf water content (RLWC), and stimulated electrolyte leakage was noticed. As a result, photosynthetic efficiency lowered with reduced root-shoot length and fresh-dry biomass accumulations. The application of EBL demonstrated significant enhancements in soybean crop growth characteristics, photosynthetic efficiency, relative leaf water content (RLWC), and reduced electrolyte leakage of ions. These improvements served to mitigate the oxidative stress induced by Cd, effectively neutralizing its detrimental impact on the soybean crop.

PP29. ADVANCES IN ENVIRONMENTAL FORENSICS: APPLICATIONS IN THE IDENTIFICATION AND TREATMENT OF INDUSTRIAL EFFLUENT

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ABSTRACT

Environmental Forensics is a multidisciplinary field that has been increasingly used to investigate environmental contamination, and its sources scientifically. This review article presents an overview of the current state of research in Environmental Forensics, with a particular emphasis on applying its methodologies in the detection and ongoing treatment of industrial effluent. The article covers the different analytical techniques used in Environmental Forensics, including chemical fingerprinting, and their applications in the identification and apportionment of pollutants in water and soil samples. The article highlights the importance of Environmental Forensics in assessing the extent of contamination and its impacts on human health and the environment. It also examines the forensic investigation of industrial effluent, including the identification of industrial sources of pollution and the tracking of pollutants through different environmental media. Furthermore, the article discusses the current challenges and future directions of Environmental Forensics research in the investigation of various industrial effluents, including the development of new analytical methods for detecting emerging contaminants and the assessment of long-term environmental impacts. It highlights the importance of interdisciplinary collaborations and the need for standardization and validation of analytical techniques to ensure the reliability and reproducibility of Environmental Forensic investigations.

PP30. STUDY OF TOTAL POLYPHENOL AND TOTAL FLAVONOID CONTENT IN VARIOUSLY PROCESSED GARLIC EXTRACTS (HG17)

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ABSTRACT

Plants produce many secondary metabolites which are being used by humans as antioxidants or to prepare medicines. Polyphenols act as antioxidants because of their potential to provide hydrogen atom to free radicals and metal chelating potential to reduce metal ion reactions. Garlic is well known for its organosulfurous compounds, an effort was made to estimate its phenolic and flavonoid content. CCSHAU, HISAR provided the HG17 variety of garlic used in this investigation. To conduct the experiment, garlic was processed in four different ways: fresh, dry, heated, and aged-with various solvents (50 percent methanol, and butanol). Flavonoid estimation and polyphenol estimation were carried out according to standard protocols. Dry garlic 50% methanol has the highest number of polyphenols and flavonoids indicated maximum efficiency to decrease the number of free radicals. Polyphenols and flavonoids are least extracted with butanol solvent. Total phenolic content (TPC) of the garlic extract's varied significantly. TPC varied widely ranging from 357.94 ± 0.0029 GAE in DgB to 2567.67 ± 0.0036 in DgM µg GAE/g of fresh garlic weight. TPC in different extracts was in the following order: DgM > AgM > AgB > FgM > FgB > HgM > HgB > DgB. The flavonoid content was expressed as µg quercetin equivalents per gram of fresh garlic weight ranged from 355.77 ± 0.0018 in DgM to 56.22 ± 0.002 in HgB. Garlic 50% methanolic extract reported maximum TPC (60.38 ± 0.23 mg GAE/100 g) and TFC (58.45 ± 1.24 mg QE/100 g).

PP31. ACUTE TOXICITY OF AN EMERGING HERBICIDE, DIURON IN MAJOR FRESHWATER CARPS

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ABSTRACT

The median lethal concentration (LC50) is the concentration of a chemical in the water that leads to death of 50% of the animals in a given population under a defined set of experimental condition. Acute toxicity studies are essential for characterizing toxic effects of chemicals. In the present study, we have determined the acute toxicity (96 hr LC50) of Diuron in major freshwater carps which are well eaten and cultured globally. Diuron has been detected with concentrations of >10,000 ng/L, 2710 ng/L, 4810 ng/L in Indian waters and other matrices like soil and sediments. Several sets of experiments were designed to generate the raw data for the determination of LC50 of diuron in major freshwater carps. For *Cyprinus carpio*, eight concentrations (10, 13, 15, 18, 21, 24 27 and 30 mg/L) were used & fish mortality was calculated for 96 hours in the experiment and LC50 was determined through Probit analysis. The calculated 96 hr LC50 of common carp was calculated to be 19.6 mg/L. This study might help organizations strategize to reduce ecological risks associated with pesticide use in aquatic environment.

PP32. THE DIVERSITY OF THE MICROBIAL COMMUNITY AND POTENTIAL FOR HYDROCARBON AND CARBOHYDRATE DEGRADATION IN A HIMALAYAN ARTIFICIAL LAKE ARE SHOWN BY A THOROUGH METAGENOMIC INVESTIGATION APPROACH

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ABSTRACT

In this study, a thorough metagenomic investigation of the high-altitude artificial lake in the Himalayas, located in the Indian state of Sikkim, was performed. It offers thorough understanding of the taxonomic distribution and potential uses of the aquatic habitat. The high-altitude lakes serve as natural homes for a wide variety of microbial communities. These bacteria are effective suppliers of several enzymes. The goal of this study is to carry out extensive metagenomic profiling of an artificial lake ecosystem in the Sikkim Himalayan region, determine this site's potential for hydrocarbon degradation, and mine biocatalysts of industrial significance. In the current study, metagenomic analysis of an artificial Himalayan Lake in North Sikkim, India, was carried out. The metagenomic analysis identified the genomic fingerprints of the iron-reducing bacterium *Geothrix fermentans* at this iron-rich location. When this site was aligned against the CAZy database, it was discovered to be a rich source of commercially useful carbohydrate modifying enzyme. The findings suggest that this site could be a useful metagenomic resource for mining genes for industrially important enzyme β-galactosidase that might be active at low to moderate temperatures. The metagenome of the synthetic lake was also compared to those of freshwater and saltwater lakes that are accessible to the general population. It was discovered to be more like freshwater Lake Metagenomes, such as those from freshwater Medonta Lake in the US and freshwater Vanda Lake in Antarctica, both at the taxonomic and functional levels.

PP33. POLYETHYLENE-NANOPLASTIC INDUCED BEHAVIOURAL ALTERATIONS AND NEUROTOXICITY IN WISTAR RATS

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ABSTRACT

Micro and nanoplastics are ubiquitous environmental contaminants to which humans are predominantly exposed through ingestion, constituting a considerable health risk. In order to evaluate the toxicity of nanoplastics, we synthesised and characterised polyethylene-nanoplastics (PE-NPs) employing precipitation-based ultrasonication method using commercially available polyethylene pellets. The present study aimed to explore the dose-dependent neuro-toxicological profile of PE-NPs in male Wistar rats. For this, oral exposure

of PE-NPs was given for 35 days to Wistar rats. Neuro-behavioural assessment of PE-NP exposed rats exhibited impaired cognitive functions and depression-anxiety-like behaviour indicating the neuro-toxicological response of the nanoplastics. At the cellular level, PE-NPs triggered oxidative stress through increased production of reactive oxygen species (ROS) and reduced the antioxidant defense system in cerebral cortex. Furthermore, disrupted BBB and histopathological alterations in cerebral cortex validate nanoplastics induced neurotoxicity. Moreover, these structural and biochemical aberrations form the basis for decreased levels of acetylcholinesterase (AChE) in the cortex region and formed the basis for neuro-behavioural deficit in rats. These finding contribute to the understanding of the multifaceted health risks posed by PE-NPs on biological systems and highlight the importance of further research on long term consequences of nanoplastics exposure and devising effective mitigation strategies to address this pressing environmental and public health challenge.

PP34. IMPACTS OF ALIEN INVASIVE PLANTS ON SOIL NUTRIENTS IN DIFFERENT ALTITUDES ARE CORRELATED WITH SOIL ENZYME ACTIVITIES: INSIGHTS FROM CIRSIUM ARVENSE (L.) SCOP. IN THE ARID REGION OF LEH, LADAKH

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ABSTRACT

Ladakh, a cold desert, in the Trans-Himalayan region of the western Himalaya, has a unique topography, physiography and climatic conditions. It is known for its sparse yet diverse floristic wealth. *Cirsium arvense* (L.) Scop. is an invasive species in Ladakh, which is replacing the native palatable species in the pasturelands and poses negative impacts on the invaded habitats. *Cirsium arvense* has been determined as a potential threat to pastoral and agricultural vegetation and soil ecosystem. Plant invasion can modify soil nutrient, which in turn may affect the activities of soil enzymes. Hence, soil enzyme activity is determined as one of the important parameters to study the impact of plant invasion. With this view in mind, the present study was undertaken to investigate the impact of *C. arvense* on the soil nutrient dynamics. Soil samples were collected from selected regions and transported to the laboratory. The samples were stored at −20°C, which is the optimal temperature to preserve enzymatic activities. Soil physiochemical properties such as pH, electoral conductivity, bulk density, soil porosity, AN, AK, AP were determined. In addition, soil enzymes- protease, dehydrogenase, beta-Glucosidase, acidic phosphatase, alkaline phosphatase, and urease, were also measured from soils of uninvaded and invaded habitats. The results showed significant ($p \leq 0.05$) variation in physiochemical properties as well as soil enzyme activities of the soil collected from invaded and non-invaded sites. Hence, it can be concluded that *C. arvense* has the potential to modify the soil physiology making it suitable for their growth and proliferation.

PP35. ENZYMATIC ANTIOXIDANT EXPRESSION OF OKRA IN RELATION TO YELLOW VEIN MOSAIC VIRUS

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ABSTRACT

Okra being rich in minerals, dietary fibers, vitamins and antioxidants, is well known for its nutritive and medicinal values. Its seed contain balanced level of lysine and tryptophan amino acids, providing a healthy food option. But productivity is intimidated by various biotic/abiotic factors. One of major biotic factors resisting its productivity is Okra Yellow Vein Mosaic Virus (OYVMV), resulting 30-100% yield loss. In severe circumstances, diseased leaves turn totally yellow/creamy, and chlorophyll breakdown initiates in veins and vein starts bending. YVMV infestation instigate oxidative stress in plant via increased reactive oxygen species production which is counteracted by altered expression of enzymatic antioxidants (catalase-CAT, ascorbate peroxidase-APX, peroxidase-POD). Thus, objective of study was to determine the change in enzymatic antioxidant activities after artificial inoculation of YVMV in 23 okra introgression lines (ILs). The disease scoring and leaf harvesting was carried out at 45 days after inoculation. Based on disease scoring, 21 ILs were categorized as resistant and two as susceptible. On inoculation, increased CAT and APX activities were observed in resistant ILs than control, however, decreased in susceptible ILs. Whereas, POD revealed increased enzymatic activity in both resistant as well as in susceptible ILs. Okra ILs 307, 314 and 329 had maximum CAT (839.47 µmoles of H2O2 decomposed/min/g FW), APX (5343.75 nmoles of MDHA produced/min/g FW) and POD activities (34.09 µmoles of tetraguaiacol appeared/min/g FW). The data from the present investigation could be utilized to identify molecular markers pertaining to influenced biochemicals which could be further characterized functionally.

PP36. PHYTOCHEMICAL ANALYSIS AND ANTIOXIDANT ACTIVITY OF LIVERWORT MARCHANTIA PALMATA FROM HIMACHAL PRADESH

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ABSTRACT

The present study aimed to investigate the phytochemical composition and antioxidant activity of various solvent extracts of liverwort *Marchantia palmata* collected from Kangra, Himachal Pradesh, India. Total phenolic and flavonoid contents were analyzed using the Folin-Ciocalteu and aluminum chloride methods, respectively. While the free radical scavenging activities were determined in-vitro using DPPH, FRAP, and Metal chelating assays. FTIR and GC-MS analyses of the most potent fractions were carried out to determine the presence of functional groups and the volatile composition of the liverwort. The total phenolic content (128.5±0.52 mg GAE/g DW) and total flavonoid content (89.13±0.15 mg RE/g DW) in methanol extract were found to be significantly higher as compared to those in other solvent fractions. Also,

among all the studied solvent extracts, methanol extract exhibited the highest DPPH radical inhibition and metal chelation activity. Whereas the highest reducing power was observed in the case of acetone extract. Results revealed that *M. palmata* acts as a potent antioxidant agent due to its high phenolic content and free radical scavenging activity and can be explored pharmaceutically.

PP37. HD-ZIP TRANSCRIPTION FACTORS IN ORCHIDS: A STUDY IN SILICO

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ABSTRACT

The homeodomain-leucine zipper (HD-ZIP) gene family constitutes an important class of transcription factors found in plants that play crucial roles in various aspects of growth, development and stress regulation. Despite this, there have been minuscule reports on identification and characterization of HD-ZIP gene family in orchids. The present study identifies 31 putative genes (AsHD-ZIP) in *Apostasia shenzhenica*, using in silico approaches. All of the identified transcription factors were grouped into four subfamilies (HD-ZIP I to IV) based on the distribution of various conserved domains and motifs i.e., HD-ZIP I (homeodomain and leucine zipper), HD-ZIP II (homeodomain, leucine zipper and CPSCE), HD-ZIP III (homeodomain, leucine zipper, MEKHLA and START) and HD-ZIP IV (homeodomain, leucine zipper and START). Prediction of physicochemical properties, protein structures, protein-protein interactions, gene structures, and gene ontology further validated this classification. Phylogenetic analysis showed clustering of all subgroups separately along with their orthologs in *Arabidopsis thaliana, Oryza sativa, Dendrobium catenatum* and *Phalaenopsis equestris*. Furthermore, spatio-temporal expression profiling and presence of cis-regulatory elements confirmed tissue specific expression. As HD-ZIP genes are vital players in regulation of plant growth and development as well as in biotic and abiotic stress responses, this study provides a foundation for genetic improvement in orchids through functional validation and characterization of HD-ZIP gene family.

PP38. INHIBITORY ACTIVITY OF SALICYLIC ACID DERIVATIVES AGAINST PATHOGENIC MUCORALE RHIZOPUS ARRHIZUS

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ABSTRACT

Mucorales are causative agents of mucormycosis, an angioinvasive, fatal infection that usually occurs in immunocompromised individuals and is transmitted by spore inhalation, or less commonly by traumatic implantation or ingestion. *Rhizopus arrhizus* is a common species responsible for this disease. A surge in the number of mucormycosis cases was observed during the second wave of COVID-19, with an estimate of 2.1-fold increase in cases compared to the pre-pandemic period. Limited treatment options are available against this disease and there is an urgent need for alternate drug options. The present study therefore aimed to evaluate

the activity of salicylic acid and its derivatives as antifungal agents against *R. arrhizus. R. arrhizus* was cultured on Sabouraud dextrose agar and the spores were harvested from culture plates. 1×105 spores/ml were exposed to six test agents at a range of concentrations (4, 8, 16, 32, 64 and 128 µg/ml) for 24h at 37°C and the antifungal activity was evaluated by radial growth assay. Synergy with amphotericin B was also evaluated. Out of the six test agents, two test agents substantially inhibited the growth of *R. arrhizus*, with the mean radial growth diameters of 38.37 ± 2.29 mm and 17.12 ± 1.94 mm respectively at 64 µg/ml and 30.00 ± 1.05 mm and 3.75 ± 0.35 mm respectively at 128µg/ml respectively compared with the untreated controls (42.58 ± 1.53 mm). The compounds also showed additive effect with amphotericin B. Similar results were noted in *Rhizomucor pusillus*.

PP39. ANTIFUNGAL AND ABIOTIC STRESS TOLERANCE PROPERTIES OF PLANT GROWTH PROMOTING ENDOPHYTIC FUNGUS ASPERGILLUS TERREUS CR7

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ABSTRACT

The long-term use of chemical fertilizers shows serious negative effects on soil quality and contribute environmental damage. To minimize the excessive use of chemical fertilizers there is a need to develop new eco-friendly approaches. Endophytic microorganisms could be used as a better option to improve agricultural productivity without using chemical fertilizer. Endophytes are microorganisms that reside inside the host plant without exhibiting any apparent symptoms. Endophytic fungi are known to stimulate plant growth by producing secondary metabolites and can also improve plant growth under various biotic and abiotic stresses. Keeping in view their importance in plant growth, endophytic fungi were isolated and screened for their various plant growth promotion activities and biotic and abiotic stress tolerance. The culture *Aspergillus terreus* CR7 isolated from *Catharanthus roseus*, showed good plant growth promotion activity viz. Indole-3-acetic acid (IAA) production, phosphate solubilization and ammonium production. *A. terreus* CR7 also had the ability to grow in high salt concentration up to 15%NaCl and ability to grow on various heavy metals viz. nickel, cobalt, cadmium, lead, cupper up to 500mg/L. Ethyl acetate extract of *A. terreus* CR7 also exhibited antifungal activity against various phytopathogens viz. *Alerneria alternata Cladosporium herbarum, Fuarium oxysporum*, etc. To observed morphological deformities fungal hyphae were picked from the surrounding of inhibitory zone and observed under microscope.

PP40. EFFECT OF DIFFERENT DRYING METHODS ON THE BIOACTIVE PROFILING OF GRAPE WASTE

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ABSTRACT

Valorization of grape waste, a by-product of the winery industry, has gained attention recently since it can help reduce environmental effect besides adding value to the winemaking process by recovering a number of biologically active compounds. In this study, the effects of different drying methods (air tray drying, shade drying and sun drying) on the stability of bioactive compounds were investigated. In particular, tray drying (55± 2℃; for 16 hour), shade drying (ambient conditions; for 72 hour) and direct sun drying were performed and bioactive compounds profiling has been studied to optimize the drying process for effective extraction of bioactive compounds from the grape waste (cultivar viz., Punjab MACS Purple) to get utilized for food fortification. Bioactive compounds in terms of polyphenols, flavonoids and anthocyanins have been extracted and quantified by colorimetric and GCMS analysis. There is significant reduction in stability of the bioactive compounds as compared to the control content (7.02%, 3.98%,10.60% anthocyanins, flavanoids, phenolics respectively). Air tray drying resulted in maximum stability of the bioactives (5.94%, 2.95%, 7.90% anthocyanins, flavanoids, phenolics respectively) followed by shade drying (3.49%, 1.06%, 3.85% anthocyanins, flavanoids, phenolics respectively) and sun drying (2.68%, 0.865, 1.96% anthocyanins, flavanoids, phenolics respectively). However, considering all the results obtained for the different drying methods, the most suitable method for grape pomace was air tray drying providing the highest retention of bioactive compounds.

PP41. CURCUMIN-LOADED BUTEA MONOSPERMA GUM-BASED HYDROGEL: A NEW EXCIPIENT FOR CONTROLLED DRUG DELIVERY AND ANTI-BACTERIAL APPLICATIONS

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ABSTRACT

The wide spectrum of applications provided by curcumin has attracted researchers worldwide to identify its molecular targets and employ it in various biomedical applications. The present research work focuses on the development of a *Butea monosperma* gum-based hydrogel encapsulated with curcumin and further employing it for two diverse applications, i.e., drug delivery and anti-bacterial application. A central composite design was utilized for the optimization of significant process variables to achieve maximum swelling. Furthermore, the characterization of the synthesized hydrogel was performed via FTIR, SEM, TGA, H1-NMR, and XRD analysis. The encapsulation efficiency of curcumin in the hydrogel was reported to be 93 % and 87.3 %, respectively, wherein BM-g-poly(AA) ~ Cur exhibited excellent sustained pH-responsive site release of curcumin at two different pH values, with the maximum amount of release taking place at pH 7.4 (792 ppm) and a minimum at pH 5 (550

ppm) due to the lesser ionization of the functional groups present in the hydrogel at a lower pH value. Additionally, the results from the pH shock studies indicated our material to be stable and efficient even with fluctuations in pH. Furthermore, anti-bacterial studies revealed that the synthesized BM-g-poly(AA) ~ Cur was effective against both gram-negative and gram-positive bacteria, with maximum values of zones of inhibition of 16 mm in diameter. As a result, the newly discovered BM-g-poly(AA) ~ Cur properties reflect the hydrogel network's suitability for drug release and anti-bacterial applications.

PP42. UNRAVELING THE COMPLEX INTERPLAY BETWEEN PESTICIDES AND CLIMATE CHANGE WITH SPECIAL REFERENCE TO ECOSYSTEM HEALTH.

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ABSTRACT

Pesticides and climate change interact intricately, resulting in a complex relationship that affects human well-being globally and shapes ecological dynamics specially earthworms. As ecology specialist, earthworms are vulnerable due to excessive use of pesticides in the field. Due to climate change as the temperature increases, it impacts precipitation which further tampers with the soil pH which adversely affects the existence of earthworms on field. This study explores the intricate interactions between these variables, emphasizing the emergence of a vicious cycle with significant ramifications. Pesticides, which are essential for controlling agricultural pests, unintentionally cause climate change throughout their lifetimes. Variations in climate are specially temperature and soil moisture affects the availability of pesticides in the soil and growth and reproduction of earthworm. Pesticide production, distribution, and use release greenhouse gases, and pesticide residues contaminate ecosystems and water supplies, harming organisms that aren't intended targets. On the other hand, pest management is challenged by the changing climate. The efficacy of pesticides may decline as temperatures rise and precipitation patterns change, requiring increased use to counteract changing pest behaviors. There is more of a cyclical relationship here. Climate change may increase pest pressures, resulting in increased pesticide use. In turn, the increased pesticide use amplifies emissions and contaminant release, thereby accelerating climate change. For the sustainability and health of the ecosystem, as well as for human food security and health, this cycle presents significant challenges. This complex problem calls for a thorough paradigm shift in approach.

PP43. TAXONOMIC STUDIES ON INSECT DIVERSITY IN THE ROPAR WETLAND (RAMSAR SITE) OF PUNJAB (INDIA)

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ABSTRACT

Wetlands play a crucial role in animal biodiversity, as they are very diverse and productive ecosystems that include marshes, swamps, bogs, and other areas with waterlogged soil. Ropar

wetland is one of the six wetlands present in Punjab state of India. It is a man-made freshwater riverine and lacustrine wetland that provides shelters for about 35 species of fishes, more than 150 species of local and migratory birds, mammals, and approximately 20 genera of insets species. Insects play a crucial role in wetland ecosystems, contributing to various ecological processes that help maintain the health and balance of these unique environments. During the present study 12 major insect orders found which are Coleoptera with 116 specimens, Diptera with 93 specimens, Hemiptera with 108 specimens, Dermaptera with 17 specimens, Odonata with 106 specimens, Orthoptera with 89 specimens, Hymenoptera with 52 specimens, Plecoptera with 35 specimens, Blattodea with 19 specimens, Mantodea with 18 specimens, Ephemeroptera with 46 specimens and Neuroptera with 26 specimens exclusively found in the wetland area. These orders comprise aquatic (7 orders) and terrestrial insects and some insect orders act as pollution indicators like Trichoptera, Plecoptera, and Ephemeroptera, which indicate the water quality indices of the wetland. Their presence shows good quality of water. The present study reveals that till now there are more than 50 genera of insects found in the wetland area.

PP44. HANDWRITTEN SIGNATURES-FORENSIC ASPECTS

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ABSTRACT

The aim of this study was to identify various features to establish the simulated forgery. The identification of a writer from signatures is a great task for a forensic document examiner; they identify the similarities and differences in the handwriting characteristics of genuine and simulated signatures and tell about the common or different authorship. A genuine model signature was provided to the participants and they were asked to copy it exactly. The writer/forger first looks at the genuine model signature and then moves his hand carefully and slowly to follow the strokes/letters/lines of the genuine model signature. In this type of forgery, the writer lifts the pen many times to see the track of the genuine model signature. It is quite understandable that the strokes of the simulated signatures are executed slowly and showing by the forger. The pen pause is also found many times in the simulated/copied signatures as the writer has to stop the pen to check whether it is going in right direction or not. This study indicates that the length, height, skill, pen-lift, pen-pause may significantly vary in the simulated signature in comparison with the genuine model signature. The study concludes that based upon the extracted and comparative features and the experience and skill of the forensic document examiner, the forged signatures can be identified in forensic examinations.

PP45. DETERMINATION OF POLYPHENOLS AND FLAVONOID CONTENT IN MEDICINAL HERB SHYAMA TULSI (OCIMUM TENUIFLORUM)

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ABSTRACT

Medicinal herb are natural sources of drugs and beneficial for various purpose. Shyama Tulsi (*Ocimum tenuiflorum*), a Lamiaceae family herb revered in India for its spiritual, religious, and medical properties. Consumption of dark leaves Tulsi has been shown to have a variety of biological and pharmacological effects in cells cultivated in vitro as well as in animal models. Shyama Tulsi is known to have anti-cancerous, antidiabetic, hepato-protective, anti-inflammatory, anti-carcinogenic, radioprotective, chemo-preventive, anticoagulant, anti-stress, and antiviral properties may be due to antioxidative properties of the plant. In the present study leaves of Shyama Tulsi were extracted in methanol and sequentially fractionated with n-hexane, ethyl acetate and butanol solvent. For determination of total phenolic, flavonoid content Folin-Ciocalteu colorimetric method or aluminum chloride colorimetric method were used respectively. Both phenolic and flavonoid content were highest in methanol solvent (863.63±0.17 mg GAE/g extract, 310.16±0.25 mg QE/g extract respectively) followed by n-butanol, ethyl acetate and n-hexane fraction. Phenolic and flavonoid may efficiently remove free radicals, good scavengers of Oxidizing molecules including singlet oxygen or exchange H+ quickly directly contributes as antioxidant to prevent cellular damage associated with oxidative stress. Due to higher TPC, TFC and positively correlated with antioxidant potential, Shyama Tulsi can be used as an alternative medicine source for treatment of various ailments and human health problems.

PP46. A COMPARATIVE STUDY OF GENUINE AND SIMULATED CHEMICAL COMPOSITION AND ANTILEISHMANIAL ACTIVITY OF ESSENTIAL OIL FROM A HIGH-ALTITUDE HERB, HERACLEUM PINNATUM: AN IN VITRO STUDY

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ABSTRACT

Heracleum pinnatum C. B Clarke is an aromatic medicinal herb that has been used for centuries as a traditional medicine in the Amchi system of Ladakh, India. Due to their usage in herbal medicine preparation and therapies, the plant plays a key role in mankind. The therapeutic effects of *H. pinnatum* are attributed to its volatile components. The intended goals of the current study were to identify the volatile components of essential oil from *H. pinnatum* grown in the high-altitude region of Trans-Himalayan Ladakh and evaluate its leishmanicidal and cytotoxic potential. GC-MS assisted in the identification of 26 components, corresponding to 98.05% of the total oil composition, with bornyl acetate (42.45%), γ-terpinene (14.05%), p-cymene (10.94%), and limonene (9.06%) being the major components. The yield of oil was

0.5±0.02% (w/v). Antileishmanial assay showed that *H. pinnatum* essential oil restricts the proliferation of promastigotes of the disease-causing protozoan Leishmania donovani (IC50 = 0.677 µg ml–1). *H. pinnatum* essential oil was found to be non-toxic towards the BALB/c macrophage cell line (RAW 264.7) with a CC50 of ~117 µg ml–1 and a selectivity index of 172.90. The results indicated that the essential oil of *H. pinnatum* aerial parts possessed promising antileishmanial and cytotoxic properties. Further research is needed to assess the toxicity of *H. pinnatum* oil in order to explore its complete potential for therapeutic uses for humans.

PP47. BIOSYNTHESIS AND CHARACTERIZATION OFHYDROXYAPATITE/ COLLAGEN BIO-COMPOSITE DERIVED FROM THE FISH SCALES OF CYPRINUS CARPIO LINN.

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ABSTRACT

The fish scales have a huge untapped potential for value addition as it contains the cardinal materials i.e., hydroxyapatite (HAp) and collagen that finds its applications in various areas of research including biomedical and environmental. When compared to other natural polymers like albumin and gelatin, collagen has better biodegradability, antigenicity, and biocompatibility. Therefore, the aim of this study is to extract those cardinal materials and formulate a composite. In the present study, the scales of *Cyprinus carpio* Linn. were used to extract hydroxyapatite by calcination of pre-treated scales and collagen by acid solubilized method. The HAp/collagen bio composite was made and characterized by FTIR, FESEM and antimicrobial test. The comparison between the FTIR of lyophilized collagen and hydroxyapatite/collagen bio composite cross-linked by glutaraldehyde showed slight elevation of specific peaks indicating the interactions such as formation of amide bonds, hydrogen bonds and electrostatic forces between the molecules. The surface topography by FESEM showed the microstructure of the composite demonstrating a sponge like structure possessing pores and collagen fibrils embedded with clumps of hydroxyapatite particles. The bio-composite showed no antimicrobial properties against *E. coli* and *S. aureus* against antibiotic amoxicillin and no zone of inhibition was observed around the bio-composite. Thus HAp/collagen bio-composite is an ideal and very promising bio-inspired material for a variety of biomedical and environmental applications.

PP48. BIOINFORMATICS BASED PIPELINE TO DISCOVER POTENTIAL BIOMARKERS AND MOLECULAR PATHWAYS LINKING POLYCYSTIC OVARIAN SYNDROME WITH NUMEROUS HORMONE IMBALANCE DISORDERS: A GENE EXPRESSION STUDY

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ABSTRACT

With a prevalence rate ranging from 4 to 20% worldwide, polycystic ovarian syndrome is one of the most prevalent hormonal conditions among women of reproductive age. Due to its multiple clinical manifestations and symptoms that overlap with those of other illnesses, PCOS usually remains undiagnosed or is incorrectly diagnosed despite its high prevalence. The concern is developing over the high prevalence of polycystic ovary syndrome in women and its link to other severe hormone-imbalanced disorders. Therefore, in order to address this, we developed a transcriptome analysis of PCOS and its correlation with other hormone-imbalanced diseases such as infertility (IF), endometriosis (EN), insulin resistance (IR), and ovarian (OC) and uterine cancer (UC) using a bioinformatics pipeline. We discovered that EC, OC, CC, and TC all share certain differentially expressed genes (DEGs) with PCOS. Based on the multilayer network and neighbor-based benchmarking, we have constructed gene-disease association networks using the identified genes. The pathway enrichment that enhanced our comprehension of the basic molecular mechanisms of the advancement of PCOS-related hormone-imbalanced illnesses was examined. Based on the literature study for molecular docking with drugs and Cytoscape's Maximal Clique Centrality (MCC) value, we determined the most important hub proteins for therapeutic intervention. The compounds' ADMET properties have been examined to determine which is most promising. In order to accurately diagnose and cure a variety of disorders, we suggested that the pathway we uncovered, hub proteins, and phytocompounds may serve as new targets and therapeutic treatments.

PP49. DIURNAL BEHAVIOUR OF INDIAN FLYING FOX PTEROPUS MEDIUS (TEMMINCK, 1825) AT JYOTISAR IN DISTRICT KURUKSHETRA, HARYANA

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ABSTRACT

Indian flying fox, *Pteropus medius* is one of the world's largest fruit bats, belonging to the family Pteropodidae and suborder Yinpterochiroptera and distributed throughout the country. The current study conducted from April 2021 to March 2022 to document the diurnal roosting behaviour of *P. medius* at Jyotisar roosting site in district Kurukshetra. Scan sampling method was adopted to collect the data regarding different types of diurnal behaviour. The frequency of a particular diurnal behaviour was calculated among different months of the year as well as

different time blocks of the day (morning, noon, afternoon and evening). A number of behavioural categories i.e., sleeping, grooming, wing spreading, wing flapping, flight, fight/aggression, movement, mating, nursing/maternal, defecation/urination, panting, yawning, belly soaking, alert, chatter and squawk were observed. A total of 16 hours (1hour and 20 minutes in one day) were spent in recording the diurnal behaviour and resulted in 3498 events of 15 different behavioural activities. The result revealed that the main diurnal activity patterns of *P. medius* throughout the year consisted predominantly of sleeping (44.78%) followed by grooming (21.44%), wing spreading (11.47%) and wing flapping (11.34) at this study. Maximum sleeping and grooming were observed during morning hours while maximum wing spreading and wing flapping were during afternoon hours. Different behavioural units were defined with the aim of facilitating further research and implementation of effective conservation strategies to monitor, protection and management of *P. medius*.

PP50. PRIMARY INVESTIGATIONS OF BUTTERFLY FAUNA IN DISTRICT KURUKSHETRA, HARYANA (INDIA)

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ABSTRACT

Despite enormous diversity, abundance and role in biodiversity and ecosystem, little is documented about butterfly fauna in the region of Haryana. Although protected areas were explored to a certain level but systematic study are lacking outside the protected areas of Haryana. Therefore, we aimed to generate a baseline data of the diversity and distribution of butterflies' fauna in district Kurukshetra, Haryana. District Kurukshetra occupies an area of 1530.00 km² having four Sub Divisions. (Thanesar, Pehowa, Shahbad and Ladwa). From March 2023 to August 2023 fortnightly field visits were conducted for the regular butterfly surveys in the selected study area following Pollard walk method and Random Sampling Method. A total of 30 butterfly species belonging to five families Papilionidae, Pieridae, Nymphalidae, Hesperiidae and Lycaenidae were documented over six months study period. The results showed that family Lycaenidae were the most dominant one with highest RDi 30%, having 9 species (9 genera) followed by Pieridae possess 8 species (6 genera); Nymphalidae with 6 species (4 genera); Hesperiidae with 4 species (4 genera) and least dominated by Papilionidae with 3 species (2 genera). The findings can be used as an important key source to evolve better management and conservation strategies for various butterfly species as their abundance indicates the well being of an ecosystem.

PP51. IDENTIFYING VARIOUS PET-CT ASSOCIATED ARTIFACTS IN ROUTINE CLINICAL SETUP TO AVOID FALSE INTERPRETATION AND REPEATED STUDY

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ABSTRACT

Since the introduction of PET (Positron Emission Tomography) in mid-1970s, it has become an important imaging modality for cancer staging, treatment response evaluation and follow up. Further, development of hybrid imaging viz PET-CT (Computed tomography) served dual purpose; anatomical information along with attenuation corrected physiological/metabolic information reducing the cost of investigation and waiting time for patient. However, for the correct interpretation of a PET-CT study, one requires complete understanding of the limitation of the hardware, software and normal physiological distribution of 18 F-fluorodeoxyglucose (FDG), the routinely used radiotracer, avoiding the artifacts being encountered in routine PET and CT. Artifacts not only degrade the image quality of both PET and CT images, it leads to improper diagnosis too. The present study demonstrates the various artifacts encountered during acquisition of PET and CT images in routine nuclear medicine imaging procedures. The various PET artifacts observed are high muscle uptake in case of strenuous physical activity before study, bladder activity obscuring underlying lesion, dose extravasation leading to false SUV measurement, brown fat uptake in cold temperature environment and mismatch at the site of diaphragm due to breathing movement. The study also witnessed CT related artifacts like: beam hardening, photon starvation, ring artifact and partial volume effect. In conclusion, there exist various artifacts that could influence the interpretations of scans and the understanding of the cause of above stated artifacts can have immense role in advancement of software and hardware technologies for avoiding and rectifying the same.

PP52. PROTOCORM FORMATION AND SEEDLING DEVELOPMENT IN HABENARIA PLANTAGINEA LINDL

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ABSTRACT

India Orchidaceae is a mega diverse family accounting for 10% of worlds flowering plants. The entire orchid family is included in the Appendix-II of the list of endangered plants, the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES). Orchidaceae, more than any other plant family, have a high proportion of threatened genera, with most containing threatened species. Therefore, the conservation measures are matter of urgency. The symbiotic and asymbiotic seed culture and other different explants used for in vitro culture is key tool for their rapid mass propagation and conservation. The immature seeds of *Habenaria plantaginea*, Lindl. a terrestrial orchid were collected from Jammu &

Kashmir in September 2022. Before inoculation the seeds were given a treatment of 4°C, for two days and were cultures on M Medium (Mitra et al., 1976) with and without plant growth regulators [Auxins (IAA, IBA, NAA) and Cytokinins (BAP, KN, TDZ)] using various combinations and concentrations. The combination IAA (1.0 mgl-1) is proved best for early protocorm formation. Early seedling development was occurred on the combination NAA+ BAP (0.5) mgl -1. The technique developed a time saving and cost-effective protocol that could be extended to other economically important rare and endangered orchids for propagation and conservation.

PP53. CHARACTERIZATION OF A NOVEL GLUTAMATE DECARBOXYLASE FROM KINEMA METAGENOME FOR GABA PRODUCTION

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ABSTRACT

ɣ-aminobutyric acid (GABA) is one of the most significant non-protein amino acids acting as a major inhibitory neurotransmitter. Glutamate dehydrogenase is a crucial enzyme for the biochemical synthesis of GABA. With the various health benefits, GABA is considered as a bioactive component in the pharmaceutical and food industries. Therefore, a novel glutamate decarboxylase (mtGAD) has been identified from the metagenomic data of a traditionally fermented Himalayan product Kinema. BLASTp analysis suggested the phylogenetic closeness of mtGAD with an uncultured bacterium, *Vagococcus* sp. Sequence similarity of the putative gene with previously characterized enzymes showed maximum identity of 57.85% with pyridoxal phosphate (PLP)-dependent glutamate decarboxylase from the organism *Lactiplantibacillus plantarum*. The gene was overexpressed in Escherichia coli BL21 expression system. The monomeric molecular mass of enzyme was determined to be ~54 kDa using SDS-PAGE. Upon biochemical characterization, the enzyme showed optimal activity at 50 ^{o}C and pH 4.5 in the presence of pyridoxal-5'-phosphate as a co-factor. The activity of the enzyme was confirmed using thin layer chromatography, high performance liquid chromatography and quantified by calorimetric assay. The catalytic properties of the mtGAD, K_m = 29.206 $\pm$ 7.831, V_{max} = 36.0017 $\pm$ 5.654. Half-life (t1/2) of the enzyme to be 3 hours at 50 ^{o}C. mtGAD activity was found to be metal ion independent. This signifies this enzyme as a potent biocatalyst for different industrial applications.

PP54. EFFECTS OF ETHANOLIC EXTRACT OF URTICA ARDENS IN AQUACULTURE DIETS: IMPACT ON EXCRETORY PATTERNS AND ANTIOXIDANT SYSTEMS IN COMMON CARP (CYPRINUS CARPIO)

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ABSTRACT

The daily ammonia and orthophosphate excretion of common carp (*Cyprinus carpio*) fed with different concentrations of nettle (*Urtica ardens*) extract in processed soybean, ground nut oil cake, and fishmeal-based formulations was evaluated with ≈38% protein. A total of 150 common carp fingerlings (Average weight 12.38 ± 0.53 g) were divided into five experimental groups, including a control group. The plant extract was added to the diets at a concentration of 0%, 0.3%, 0.6%, 0.9% and 1.2% of the formulated feed. After the 90-day feeding trial, total ammonia, reactive phosphate excretion and antioxidant activity was assessed. Ammonia excretion peaked at 2- and 6-hours post-feeding, while orthophosphate synthesis peaked at 4- and 8-hours. Orthophosphate excretion was lowest in the 0.9% group. Ammonia excretion was lowest in the 0.9% group, whereas the highest excretion of the ammonia and orthophosphate was observed in the control group. Improved nutrient uptake lowered ammonia and orthophosphate discharge into holding water thus improving water quality. Common carp fed with 0.6% diet showed increased SOD levels in the liver and kidney. On fed with 0.9% diet, lipid peroxidation (LPO) in the liver and glutathione (GSH) in the gut and liver improved. 1.2% diet led to substantial improvements in SOD, catalase, LPO, and GSH in the gut and kidney, respectively. Thus, the inclusion of nettle in diet at optimum concentration minimises ammonia and phosphate excretion patterns, thereby helping fish to flourish. Additionally, it enhances the antioxidant efficiency of aquaculture systems.

PP55. EFFECT OF CHROMIUM AND IRON ON PRIMARY AND SECONDARY METABOLITES OF MNIUM CUSPIDATUM

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ABSTRACT

The present study includes experimental work on bryophytes focused on their behaviour under varying concentrations of heavy metals - Iron and Chromium. Their impact has been studied on primary metabolites i.e., Water soluble carbohydrates, total free amino acids, total chlorophyll content and two secondary metabolites i.e., total phenolic content and flavonoid content of *Mnium cuspidatum*. Exogeneous supply of different concentrations of Chromium and Iron over regular intervals on the selected moss for up to 60 days showed significant impact on primary as well as secondary metabolites. When treated with Iron, highest content of total free amino acids (16.3±.25) was observed at 200 ppm on 30th day, water-soluble carbohydrates (24.5±.1) at 100 ppm on 30th day, total chlorophyll content (13.5±.06) at 300 ppm on 30th day, total phenolic content (48.7±.7) at 200 ppm on 15th day, total flavonoid content (15.2±.09) at 200 ppm on 15th day. Similarly, when treated with chromium, highest

content of total free amino acids (9.22±.06) was observed at 100 ppm on 30th day, water soluble carbohydrates (24.1±.11) at 100 ppm on 15th day, total chlorophyll content (8.48±.09) at 100 ppm on 30th day, total phenolic (35.2±.4) and flavonoid content (12.7±.04) at 100 ppm on 15th day. Chromium was observed to be more toxic than Iron.

PP56. NATURAL POLYSACCHARIDES BASED SUPERABSORBENT HYDROGELS AS POTENTIAL DYE ADSORBENTS: A REVIEW

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ABSTRACT

Water pollution is one of the primary causes of the water scarcity. Contaminated water is a growing concern as it poses a danger to humans and aquatic life. The problem of water contamination emerges from the discharge of industrial activities including dyes and other hazardous materials which not only pose a major threat to worldwide sustainable and green development but also degrade the quality of water by altering the physiochemical properties. The primary sources of untreated organic dyes are the effluents released without any prior treatment from the industries (textile, pharmaceutical, cosmetics and food products). The synthetic dyes are carcinogenic and noxious in nature and impact life in terrestrial as well as the aquatic environment. Over the years, various methodologies employed for the removal of dyes from wastewater has gained much attention of the scientific community to solve such environmental problems. In an effort to improve the crucial process of water purification, a variety of hydrogel-based adsorbents have been extensively developed and put through rigorous testing as we stand on a threshold of progress. This review focuses on the incredible potential of natural polysaccharides to adsorb and remove dyes from polluted water and the factors affecting their performance. Further the challenges and future directions are also addressed in the development of hydrogel-based dye removal technologies. Understanding these polysaccharides not only helps us understand the situation as it is now, but it also provides us hope for a brighter future in our attempts to purify water.

PP57. DETERMINATION OF LORAZEPAM IN FOOD SAMPLE USING CELLULOSE PAPER SORPTIVE EXTRACTION (CPSE) WITH GAS CHROMATOGRAPHY - MASS SPECTROSCOPY(GC-MS)

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ABSTRACT

In this study, a high sample throughput and green analytical method based on cellulose paper sorptive extraction (CPSE) was developed to detect LZ in spiked food matrices. Pristine cellulose paper (CP) was used as the sorptive medium to extract LZ from cream biscuits and tea samples. The method was found to be linear within the range of 0.2 - 10 µg mL^{-1} (or µg g^{-1}) with a coefficient of determination (R2) ranging from 0.996 - 0.998. The limit of detection and limit of quantification for cream biscuits were 0.054 and 0.18 µg g-1, respectively, while

for tea samples, they were 0.05 and 0.16 µg mL $^{-1}$. The relative standard deviations (%RSD) for all measurements were below 10%, and only 2 mL of methanol per sample was used during the entire sample preparation process.

PP58. CRYO-CONSERVATION OF MEDICINAL AND AROMATIC PLANTS USING VITRIFICATION-BASED TECHNIQUES

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ABSTRACT

Medicinal and aromatic plant species (MAPs) belong to a group of species that have numerous applications. MAPs are currently used in food, pharmaceuticals, herbal remedies, dietary supplements, homeopathy, medicinal and herbal teas, sweets, perfumes, cosmetics, coloring agents, varnishes, fireworks, detergents, and other plant-based products. Due to their rising demand throughout the world and habitat loss, these plants are depleting at a faster pace and facing the risk of extinction. Hence, there is an utmost need for the long-term conservation of MAPs to ensure their sustained availability. Until now, cryopreservation has been the most reliable approach for long-term conservation of plant germplasm as it requires less space and low maintenance. Cryopreservation allows long-term storage of plant germplasm at an ultra-low temperature of liquid nitrogen (-196oC) where all the cellular, biochemical, and metabolic activities cease to work. Vitrification is the most commonly used technique for cryopreservation of plant germplasm and has been employed in a wide range of medicinal and aromatic plant species. For more than a decade, vitrification-based techniques like encapsulation-vitrification, droplet-vitrification and cryoplates have also gained success in cryopreserving a number of MAPs. The assessment of genetic and biochemical fidelity in regenerated plants post cryopreservation is also an integral part of a successful cryopreservation protocol. Such analyses reveal their 'true to type' nature of regenerated plants post cryopreservation. This review highlights the advancements and challenges faced in vitrification-based techniques used in cryo-conservation of germplasm of MAPs throughout the world.

PP59. ALTITUDINAL IMPACT ON MYCORRHIZAL DIVERSITY AND SOIL PROPERTIES ALONG WITH TAXUS CONTORTA GRIFF. IN THE TEMPERATE FOREST OF SHIMLA DISTRICT

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ABSTRACT

Taxus contorta Griff. (Family Taxaceae; commonly known as western Himalayan yew, Thuna, and Rakhal) is a native plant of the temperate region of the western Himalayas. A study was conducted to examine the effect of elevation on mycorrhizal diversity and soil properties associated with the distribution of *T. contorta*. Mycorrhiza is the symbiotic association of fungi with the roots of plants. The presence of various structures of mycorrhizal fungi like

arbuscules, vesicles, and hyphae in the roots of *T. contorta* confirms the mycorrhizal association. The percentage of root colonization and spore count decreased significantly with an increase in altitude. The taxonomic analysis of AM spores reveals that a total of 18 AM species were identified among all the studied sites. The Glomus spores were found abundantly in the rhizosphere of T. contorta. Four mycorrhizal species, i.e., *Claroideoglomus etunicatum*, *Glomus aggregatum*, *G. macrocarpum*, and *Rhizophagus clarus*, were found at all the studied sites. The soil on the plant's premises was slightly acidic. The soil organic carbon and available potassium showed a decreasing trend with the increase in elevation. Canonical correspondence analysis (CCA) suggested that the increase in the concentration of available phosphorus and nitrogen decreased mycorrhizal diversity. A study concluded that the change in elevation changes the mycorrhizal diversity and soil composition in the premises of *T. contorta*.

PP60. 3-HYDROXY-3-METHYLGLUTARYL COENZYME A REDUCTASES (HMGRS): A FAMILY OF COMMITTED ENZYMES IN ALKALOID BIOSYNTHESIS IN ORCHIDS

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ABSTRACT

Terpenoid-alkaloids are one of the major classes of the alkaloids found in orchids and they are synthesised via the mevalonate (MVA) pathway and 2-C-methyl-D-erythritol-4-phosphate (MEP) pathway in plant cells. The first committed step in MVA pathway is the conversion of HMG-CoA into mevalonate which yields an isopentenyl pyrophosphate unit. This step is catalysed by an enzyme 3-hydroxy-3-methylglutaryl coenzyme A reductase (HMGR). The present study deals with in silico characterization of HMGR family in orchids. Eight putative HMGR proteins were identified and characterized from three orchids i.e. *Phalaenopsis equestris* (2), *Dendrobium catenatum* (3) and *Apostasia shenzhenica* (3). These proteins were approximately 310 to 651 amino acids long with their molecular mass ranging from 33.88-69.422 KDa. These proteins were characterised by the presence of HMG-CoA_reductase_class_I domain. In addition, two HMG-CoA binding motifs (EMPVGYVQIP and TTEGCLVA) and two NADP(H) binding motifs (DAMGMNM and GTVGGGT), were found to be highly conserved in all HMGR proteins. Phylogenetic analysis showed that HMGRs of monocots and dicots clustered separately. The tissue specific expression profiling showed variable expression for all the genes in various tissues. Characterization of the promoter region revealed the presence of cis-acting elements regulated by light, abiotic and biotic stress and plant growth and development. This in silico study paves way to decipher functional characterization of HMGR genes in orchids and their role in regulation of terpenoid alkaloid biosynthetic pathway.

PP61. ONE-POT FACILE SYNTHESIS OF ZNO-HNT NANOPARTICLES FOR ADSORPTION OF DYE-POLLUTANTS

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ABSTRACT

Environmental toxins like dyes, pose to be persistent bio-accumulative toxins. An exemplary approach for overcoming its toxicity is photocatalytic degradation. A highly potential green nanomaterial is a fine-grained clay material known as Halloysite Nanotubes (HNT). HNTs are aluminosilicates, having a dioctahedral shape and tubular morphology. The synergic effect between the halloysite and its composites aid in its catalytic activity. The current study deals with the photocatalytic application of HNT-derived catalysts.

PP62. EXPLORING THE INFLUENCE OF SALMONELLA INFECTION ON OBESITY/DIABETES USING C. ELEGANS MODEL.

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ABSTRACT

Obesity and diabetes are global epidemics, prompting the need to understand how metabolic disorders relate to infections. *Salmonella* could impact metabolic health, potentially contributing to obesity and diabetes. The worm *C. elegans* is a useful model to study *Salmonella* interactions. By employing a *Salmonella*-*C. elegans* infection model, we intend to elucidate the mechanism underlying the relationship between bacterial infections and metabolic dysregulation leading to obesity. We infected *C. elegans* with *Salmonella*, we looked for various parameters such as body length and width, life span, lipid accumulation etc. We found with infection the size of the worm was altered in terms of width and length in time dependent manner up to 96 h post infection. But glucose concentration (80mM) did not show the expected outcome rather found reduced size. Lipid accumulation has been associated with the development of insulin resistance an early hallmark for the development of diabetes was altered with *Salmonella* infection. We found that glucose toxicity was responsible for this phenotype at concentration above 20 mM of glucose. mRNA expression level for several genes associated to obesity and diabetes was found to be altered significantly at 20 mM glucose concentration and is used as positive control. We are trying to elucidate the mechanisms by which *Salmonella* influences obesity and diabetes in a simplified system. This research opens avenues for the development of targeted interventions that modulate gut microbiota to mitigate the risk of complex diseases such as obesity and diabetes.

PP63. POSTHARVEST APPLICATION OF TULSI ESSENTIAL OIL BASED CHITOSAN COATING FOR SHELF-LIFE EXTENSION OF FRESH CUT GUAVA

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ABSTRACT

The biggest problem a food manufacturer faces is the quality of food goods degrading during storage, which ultimately increases waste. Edible coating enriched with EO is recognized as a potential substitute for preserving food quality and lengthening shelf life by preventing microbiological spoilage and offering moisture and gas barrier qualities. In the current study, chitosan coating enriched with Tulsi EO has been used. GCMS analysis of Tulsi EO has revealed the presence of eugenol, borneol or other terpenoids that are responsible for its antimicrobial activity. To standardize the concentration of Tulsi EO, four different concentrations (0.5-2.0% v/v) in chitosan coating were applied over fresh cut guava by dipping method following CRD statistical design. Fresh cut guava coated with 1.5% and 2.0 % EO based chitosan coating revealed the minimum microbial load even after the storage period of 15 days with non-significant difference. Hence, 1.5% Tulsi EO concentration has been selected as optimized concentration for shelf-life studies. The shelf life study of fresh cut guava coated with Tulsi EO based chitosan coating revealed the inhibition of microorganisms till 15th day of storage with microbial count of was 4.26 log CFU/g total plate count, 2.95 log CFU/g Y&M count and 2.87 log CFU/g coliform count has revealed that treatment of fresh cut guava with 1.5% Tulsi EO was the most significant treatment to inhibit the growth of microorganisms and maintaining the physiochemical and sensorial characteristics. The microbial load during the 15 days.

PP64. ISOLATION AND IDENTIFICATION OF ORCHID MYCORRHIZA

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ABSTRACT

The Orchidaceae family is a complex group of flowering plants found in most parts of the world. Orchid mycorrhizae are unique plant relationships that involve all orchids and a variety of fungus, including *Rhizoctonia*. Mycorrhizal fungi in orchids are required for seed germination, growth, and protocorm formation. However, the fungal communities that live in various sections of orchids are not well defined. In general, PDA is proven to be the best choice for isolation. The current work attempts to isolate and identify fungi from the roots of epiphytic orchids. A combination of morphological and molecular characterizations allowed for the integration of fungal strain identification with genetic relatedness among the isolates, allowing for some inferences about the specificity of these endosymbionts under field circumstances.

PP65. INVESTIGATING THE EFFECT OF LOW TEMPERATURE PASSIVE STORAGE SYSTEM ON PHYSICOCHEMICAL AND BIOCHEMICAL PROPERTIES IN ONIONS DURING HARSH WINTER CONDITION IN LEH LADAKH.

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ABSTRACT

The onion is one of the most valuable vegetable crops in the world, and it is a mainstay in many cuisines throughout the world. The pressing need for a sustainable management system is linked to both environmental protection and increased consumer demand for food safety and quality. Since ancient times, cold temperatures have increased the shelf life of fruits and vegetables grown in temperate climates, similarly, since ancient time farmers in Ladakh's cold desert region store their goods at low temperatures. Low temperature preservation also protects invisible properties such as texture, nutrition, aroma, and flavour. As a result, the current study was carried out with the purpose of investigating different storage approaches to provide quality onions and prolonging onion shelf life. Temperature, relative humidity, physical and biochemical parameters of preserved onions in three storage structures, namely underground, semiunderground, and above ground storage, as well as their interplay, were examined for quality for 150 days during the study. The semi-underground storage structure proved more efficient in providing an acceptable environment for onion bulbs during the storage period. The overall physiological weight loss in onion is 53.67% in underground storage facilities, 46.33% in above-ground storage structures, and 34% in semiunderground storage structures. This study reveals that a semi-underground, two-sided ventilated building helps to regulate temperature and RH and is better able to minimise onion bulb deterioration and loss during storage. To prevent quality losses in onions, additional investigation and understanding of handling, temperature and RH management are critically necessary.

PP66. COUNT OF WADING BIRDS SPECIES FROM FORAGING SITES OF INDIAN SARUS CRANE (GRUS ANTIGONE) IN UNNAO, U.P.

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ABSTRACT

The Indian Sarus Crane (*Grus antigone*) is a wading bird, which are included in group of small to medium sized birds residing at the margin of water bodies. The agricultural farms and water bodies (ponds, canal sides, wetlands) of Unnao are supporting rich sites for sarus cranes along with other wading birds species, as it is a supply of immense food and water availability, required to complete their life cycles. The present study provides list of wading birds which were allocated in similar foraging sites, with Indian Sarus Crane from surveys regularly conducted in Unnao district of U.P., located at geographical co-ordinates 26°.33’0” N and 80°.28’48” E, from february 2020 to march 2023, mainly the foraging sites selected in

unprotected areas. Total of 7 species of wading birds were reported representing 5 orders and 6 families in five foraging sites. Among them maximum number of species were of Ardeidae family order ciconiformes, succeeded by order charadiformes family charadriidae, occasional visitors included order gruiformes family rallidae and ciconiformes order, jacanidea family species were all recorded from these sites. The purpose of study is to provide information of list of wading birds to recognize these sites as habitat sites for their conservation and setting up and monitoring actions strategies towards their habitat protection.

PP67. A CROSS-SECTIONAL STUDY ON THE PREVALENCE OF NON-COMMUNICABLE DISEASES IN URBAN AND RURAL AREAS OF PUNJAB

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ABSTRACT

Non-communicable diseases (NCDs), also known as chronic diseases, are medical ailments that are associated with long durations and slow progress. NCDs have become a major global public health concern, contributing significantly to morbidity and mortality worldwide. This cross-sectional study aims to investigate the prevalence of non-communicable diseases (NCDs) among both rural and urban areas of Punjab. A representative sample of 1440 individuals residing in both rural (720 subjects) and urban areas (720 subjects) of Punjab was selected for this study. Data collection was conducted through detailed surveys using a standardized questionnaire. The surveys included questions regarding demographics, lifestyle and nutritional factors, medical history, and the presence of known NCD risk factors. From the investigations it has been observed that diabetes and cardiovascular diseases are the most prevalent non-communicable disease in both rural and urban areas of Punjab. Diabetes is more common in urban areas as compared to rural whereas cardiovascular disease is more prevalent in rural areas as compared to urban areas. This cross-sectional study provides valuable insights into the prevalence of various NCDs among rural and urban areas of Punjab. Efforts should focus on raising awareness about NCD risk factors, promoting healthy lifestyles, and improving access to healthcare services

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PP68. EXPLORATION OF RBOH GENES IN BREAD WHEAT FOR THEIR ROLE IN PLANT DEVELOPMENT AND STRESS RESPONSE

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ABSTRACT

Respiratory burst oxidase homolog (RBOH) proteins in plants generate exogenous reactive oxygen species (ROS) burst in the apoplast to regulate developmental processes and stress responses. Herein, a total of 40 TaRBOH genes were identified in the genome of *Triticum aestivum* by a genome-wide search against the latest wheat database. Phylogenetic analyses divided the RBOH proteins into five clusters and the close clustering of these proteins

suggested their evolutionary relationship. The presence of duplication events (DEs) and the nature of selection (purifying) in the evolutionary analyses revealed its role in the expansion of the RBOH gene family. In Promoter analysis, cis-regulatory elements related to plant growth, hormones and various abiotic and biotic factors were found. The protein-protein and protein-chemical interactions analyses revealed the extended role of TaRBOH genes in biological and stress-induced signaling responses. In addition, miRNA interaction analyses revealed the presence of target sites for miRNAs related to growth and stress response. Further, the expression profiling in different tissue developmental stages and under stress conditions disclosed their involvement in growth, development and stress response. This genome-wide study would deliver comprehensive knowledge of the RBOH gene family in wheat and will provide a valuable reference for the functional characterization of TaRBOH genes for crop improvement.

PP69. EXPLORING THE RADICAL SCAVENGING AND ANTIOXIDANT PROPERTIES OF CALYPTOCARPUS VIALIS L., AN ALIEN INVASIVE WEED

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ABSTRACT

Calyptocarpus vialis L. (Asteraceae Family; also known as *Synedrella vialis*, straggler's Daisy), a native of the tropical regions of America, is fast acquiring invasive status in different parts of the world, including India. It is an annual and shade-tolerant herb, which can be commonly seen growing in the grasslands, roadsides, meadows and disturbed sites. With a view to utilize this fast-emerging invasive species, the present study was planned to determine its radical scavenging and antioxidant potential. For this, the leaves of the weed were collected, shade-dried and their aqueous extracts were prepared. Various assays were performed to assess its radical scavenging potential viz. DPPH (2,2-diphenyl-1-picrylhydrazyl) free radical assay and H2O2 (Hydrogen peroxide) assay whereas antioxidant potential was determined through FRAP (ferric reducing antioxidant power) and TAA (Total Antioxidant Activity). In addition, amount of total phenolics and flavonoids were also determined to correlate these with the biological activities. The results indicated that the plant has a good radical scavenging and antioxidant potential even at low concentrations and the activities were quite comparable to those of *Rosmarinus officinalis* L., a well-known herbal plant. The study concluded that the invasive weed C. vialis can be utilized as a potential source of antioxidants and phytochemicals in the near future.

PP70. TOXICOLOGY SCREENING AND ANTILEISHMANIAL EVALUATION OF PYRAZOLOQUINOLINES: A POTENTIAL DRUG CANDIDATES FOR LEISHMANIASIS

Alka Yadav[1], Sandeep Kaur[1], Shivani Thakur[1], Varsha Bharti[1], Khushvinder Dhiman[2], Deepak B Salunke[2], Sukhbir Kaur[1]

[1]Department of Zoology, Panjab University, Chandigarh, [2]Department of Chemistry, Panjab University, Chandigarh

ABSTRACT

Leishmaniasis represent a group of neglected vector-borne tropical diseases, caused by *Leishmania* species, and has become a serious health problem across many countries in the world. The currently available treatment options for leishmaniasis are associated with several limitations including adverse effects, cost, poor efficacy, and the need for multiple injections. Therefore, a dedicated focus is mandatory for developing more antileishmanial treatment agents. In this context, nitrogen containing pyrazole and its derivatives have garnered more attention due to their interesting antileishmanial properties and have been proven to be effective against protozoan diseases. The current study evaluated the *in-vitro* antileishmanial activity of some newly synthesized pyrazoloquinoline derivatives against *Leishmania donovani* parasite and the two hit compounds were tested for their efficacy in production of ROS and cell cycle analysis. Also, these two compounds were evaluated for acute oral toxicity studies according to OECD guidelines 425 in BALB/c mice for 14 days. The various in vitro assays were carried out such as cell cytotoxicity antileishmanial action, cell cycle analysis, ROS generation and Nitric Oxide production to investigate the antileishmanial efficacy of pyrazoloquinoline derivatives. *In-vivo* acute oral toxicity study was performed in BALB/c mice and various hematological, biochemical, and histopathological analysis were performed at the end of the experiment. The *in-vitro* results showed the better efficacy of KD78 and KD65 against *Leishmania donovani* promastigotes. The in-vivo results highlighted that no mortality has been observed. Hence, both can be considered non-toxic up to 5mg/kg and safe for later in-vivo antileishmanial studies.

PP71. ZOOPLANKTON: AS BIOINDICATORS

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ABSTRACT

Zooplanktons: As Bioindicators Zooplanktons are naturally occurring bioindicators which are used to assess the health of the environment and are also an important tool for detecting changes in the environment, either positive or negative, and their subsequent effects on human society. The expression 'Bioindicator' is used as an aggregate term referring to all sources of biotic and abiotic reactions to ecological change. The condition of the environment is effectively monitored by the use of Bioindicator species due to their resistance to ecological variability. Zooplanktons are microscopic animals living near to the surface of the water body. They are poor swimmers, instead relying on tides and currents as a transport mechanism. They feed upon phytoplanktons, bacterioplanktons, or detritus (i.e. marine snow). They also play an

important role as Bioindicators and help to evaluate the level of water pollution. The potentiality of zooplankton as bioindicator is very high because their growth and distribution are dependent on some abiotic (temprature, salinity, stratification, pollutants) and biotic parameters (food limitation, predation, competition). They are assumed to be a vital part in indicating water quality, eutrophication, and production of a freshwater body. In order to determine the status of a freshwater body it is necessary to measure seasonal variations and presence of zooplanktons The potential of zooplankton as a bioindicator species is high on the grounds that their development and conveyance are subject to some abiotic (e.g. temperature, saltiness, stratification, and pollutants) and biotic parameter.

PP72. DO WE REALLY NEED R.O. WATER PURIFIERS IN CHANDIGARH??

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ABSTRACT

Reverse Osmosis water purifiers are being popularly installed in the Chandigarh, for treating potable water. 56.2% the city population have been found to be using water purifiers, and 60% of the same have been using RO water purifiers. Its 12.6 lakhs population, consumes 386 MLD. It receives 67MGD potable water supply (surface water-SW) from Bhakhra Main Canal via Kajuali water works and 20MGD from groundwater (GW). The SW is treated and tested at Mother Water Works (Sector-39, Chandigarh), before being sent for consumption. A study was undertaken to understand the need and the role of water purifiers, specifically RO water purifiers, in improving the quality of potable water supply in Chandigarh. More than 350 potable water samples of Chandigarh were collected. The water samples were tested for TDS, TH, EC, pH, Ca, and Mg levels using standard methods. The average values of the SW samples were [TDS-144.02 mg/L, TH-253.47 mg/L, EC-92.38 µS/cm-, Ca-51.28 mg/L, Mg-32.05 mg/L, and pH-8.1] and of the GW were [TDS-260.25 mg/L, TH-412.5 mg/L, EC-174.36 µS/cm, Ca- 92.5 mg/L, Mg-43.5 mg/L, and pH-8.32]. MoEF & CC, GoI (2019) have advised not to use RO water purifiers with TDS > 500 mg/L. Moreover, RO purifiers lose a large amount (15 to 30 %) of the feed water. The wastage of a large amount of potable water in the city, with leakages already losing 35% (135 MLD) of its potable water, is a big question mark and a serious issue for policy planners and consumers to ponder upon.

PP73. PRESENCE OF ACRYLAMIDE IN FOOD LEADING TO TOXICOLOGICAL

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ABSTRACT

Acrylamide is a genotoxic food processing contaminant present in wide variety of commonly consumed food. Acrylamide forms mainly in food rich in starch when heated at temperature above 120°C in absence of moisture through maillard reaction. Acrylamide may also form in

food from acrolein during the degradation of amino acid, carbohydrate, lipid, and organic acid. Exposure to acrylamide may result in neurotoxicity. Such adverse effect arises from covalent abbducts formed between acrylamide and cysteine residues of several neuronal protein via a Michael addition reaction. As a Michael reactant, acrylamide avidly adds to nucleophilic centres, such as mercapto or amino group of structural and soluble plasma proteins including N terminal valence of hemoglobin. The generated Hb addicts can serve as biomarkers reflecting long term exposure since, they build up during about 3-4 month lifetime of human erythrocytes. The methods used for the sample treatment and the analysis of acrylamide are UHPLC-MS, HPLC, GC-MS. Although these traditional instrument analysis of acrylamide in food has advantage in detection stability and accuracy but it needs relatively cumbersome pretreatment which makes it far behind in real time so to combat this problem fast, low cost and convenient analytic strategies have been proposed such as capillary electrophoresis based on different charge ratio of the target substance to achieve efficient separation, AFILMC electrophoresis method combined with ionic liquid ultrasonic assisted extraction to measure acrylamide, immunoassay method, sensor analysis techniques. Acrylamide proves to be neurotoxic causing neuro-development disorder in children.

PP74. EMPOWERING WOMEN THROUGH CYBERSECURITY: SAFEGUARDING ONLINE SPACES FOR ENHANCED SAFETY

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ABSTRACT

Making sure women are safe and secure online has become a critical priority in our increasingly digital society. This poster presentation explores the critical nexus between women's safety and cybersecurity, illuminating the cutting-edge methods, tools, and awareness-raising efforts designed to protect women online. The internet has grown quickly, and women are now more connected than ever. However, this connectivity also exposes kids to several risks, including identity theft, cyberbullying, online harassment, and privacy violations. This talk examines the complex nature of these threats and emphasizes the demand for all-encompassing cybersecurity measures catered to the unique requirements of women.

PP75. CHARACTERIZATION OF INDUSTRIAL POTATO MASH WASTE FOR PRODUCTION OF VALUE-ADDED PRODUCT

Deepti Jaswal[1], Keshani[1], G.S Kocher[1], J.S Lamba[2]

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ABSTRACT

The potato has been a fundamental food source for centuries, enriched with essential nutrients like vitamins, minerals, fiber, and antioxidants. Food industries use potatoes in a variety of ways, including frozen food, chips, harsh brown, and French fries, resulting in a massive amount of potato waste that has the potential to be valorized. Therefore, the main objective of

the present work was to assess the physiochemical, structural, and phytochemical properties of potato mash obtained from potato industries so it can be utilized for the beverage production. The characterization was performed post tray drying (60°C, 18 h) and stabilisation of potato mash waste. Parameters such as moisture content (5.2%), ash (3.5%), nitrogen (1.1%), lignin (2.7%), cellulose (14.9%), hemicellulose (28.3%), silica (0.1%), crude protein (18.5%) and carbohydrates (65%) were analysed. Antioxidant scavenging activity (DPPH) was obtained around 47% which imparts bioactive properties. Fourier transform infrared spectroscopy (FTIR) study was also carried out. Based on the present results, potato mash waste showed valuable composition, which can be utilized for beverage, enzyme, bioethanol and/or biogas production.

PP76. CANCER PROGRESS, FROM PREINVASIVE TO INVASIVE STAGE, IMMUNE CELLS EVOLUTION AND DETECTION

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ABSTRACT

Cancer refers to any of those large number of diseases characterized by development of abnormal cells in the body that proliferate abnormally and destroy body tissue. It has become the second leading cause of deaths in the world consuming young lives as well. Cancer cells are self-altered cells which escaped normal growth regulating mechanisms. There are different types of cancers Carcinoma (endodermal/ectodermal tissue)80-90% cancers are the same, Leukemia/ lymphoma, Sarcoma. Cancer cells are of two types based on their invasiveness-ability to spread, Adenoma (benign) also referred as preinvasive stage of cancer cells or preinvasive neoplasia do not spread to other parts of the body whereas Adenocarcinoma (malignant) are malignant neoplasia which spread into surrounding tissue and cause damage. The term neoplasia does not imply to malignant or benign, but to new growth with distinct histopathologic microscopic appearance. In this review the development of cancer and the progress of preinvasive stages of carcinoma to invasive adenocarcinoma will be discussed along with the evolution of immune cells and their composition in the tissue. This review paper also proceeds onto discussing various clinical advancements in early detection and diagnosis of cancer cells in their preinvasive and early invasive stages.

PP77. TO EVALUATE THE BENEFICIAL POTENTIAL OF OLEANOLIC ACID AGAINST ACID ASPIRATION MEDIATED ACUTE LUNG INJURY IN MICE

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ABSTRACT

Acute lung injury (ALI) is a clinical syndrome caused by a variety of direct or indirect patho genic factors and accompanied by extensive lung inflammation, which is characterized by acute diffuse alveolar injury, congestion, and increased alveolar-capillary permeability. Anti-inflammatory effects of oleanolic acid were observed. It was administered orally at a dose of

5mg/Kg b.wt at two different time points i.e., either one hr before or 2 hr before after i.t instillation of 0.1 N HCL in mice model. Various oxidant and antioxidant parameters were assessed. Analysis of data revealed a significant rise in no. Of inflammatory cells in the BALF of HCL-treated mice. In contrast, mice treated with OA had a substantial increase in total no. of inflammatory cells in BALF. Moreover, OA treatment before HCL instillation depicted more reduction in inflammatory cells as compared to post-treatment. Examination using double chambered plethysmograph revealed ALI association with lung function alterations. Thus, OA seems to be a good candidate for the amelioration of HCL-induced ALI. Further, we will use 1 hr. before dosage to check the levels of various molecular pathways using PCR/ ELISA/ Western blotting.

PP78. CONCEPT OF URBAN GREENING - A BOON FOR HEALTH

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ABSTRACT

Commercialization and Urbanization, though a need of the hour, is majorly cutting down on the greener areas and hence linked with a majority of health issues such as chronic stress due to insufficient physical activity and exposure to the various anthropogenic environmental hazards. In recent years the value of urban green space in connection to health and wellbeing is a matter of concern. The concept of green spaces refers to a comprehensive term for all green areas in the city: parks, nature areas near population centres, green open spaces, gardens, apartment courtyards, school gardens, workplace gardens aim at exploring their benefits as components of the urban environment. These spaces not only support physical activity but improves mental health by encouraging positive social interactions, reduces morbidity and mortality in the city dwellers and also work toward reducing the exposure to air and noise pollutants and cuts down the effect of excessive heat. The greener neighbourhoods are at a low risk of poor mental health, cardiovascular diseases. A green urban environment acts as an indicator of healthy workforces with their increased productivity and earning potential which leads to enhancement of quality of life. Public green spaces are accessible for various outdoor activities as walking, cycling, playing which can promote safe mobility for all age groups and hence aims at improving health equity.

PP79. HEAVY METAL TOXICITY IN PLANTS: AN OVERVIEW

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ABSTRACT

Metals with relatively high densities, atomic numbers, or atomic weights are regarded as heavy metals (HMs). HMs are the non-essential and essential elements that negatively impact the living system when exposed at higher concentrations or longer. Agricultural soils in many parts of the world are slightly to moderately contaminated by heavy metal toxicity such as Cd, Cu, Zn, Ni, Co, Cr, Pb, and As. Indiscriminate agricultural practices like irrigation with

brackish water and excessive use of chemical fertilizers and pesticides are significant sources of toxic metals. Plants experience oxidative stress upon exposure to heavy metals that leads to cellular damage by triggering the ROS generation such as (O2.), (OH·), (H2O2) etc. In addition, plants accumulate metal ions that disturb cellular ionic homeostasis that cause protein and lipid peroxidation, DNA damage and denaturation of cell structure and membrane that finally results in the programmed cell death (PCD). To minimize ROS generation, there are enzymatic and nonenzymatic scavengers such as CAT, SOD, AsA, GSH etc. that combats the metal stress in plants. To minimize the detrimental effects of heavy metal exposure and their accumulation, plants have evolved detoxification mechanisms.

PP80. ANTI-PATHOGENIC ACTIVITY OF FDA APPROVED QUERCETIN AGAINST PPK OF E. COLI: A MOLECULAR DOCKING APPROACH

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ABSTRACT

Polyphosphate kinase (PPK) plays a critical role in the synthesis and accumulation of inorganic polyphosphate (polyP) molecules, which is helpful in survival of *E.coli* during stress condition. Therefore, it is anticipated that inhibiting can lead to the attenuation of *E.coli* virulence. Through computational analysis, we aim to identify potential ligands that can bind to PPK which will help in prediction of binding affinity and stability of PPK-ligand complexes using AutoDock. Total of 10 FDA approved phytochemicals were chosen and docked with "1XDO" (Crystal Structure of *Escherichia coli* Polyphosphate Kinase), among which Quercetin gave the best result with the binding energy of -8.23 Kcal/mol. This study provides a better understanding of how PPK interacts with different ligands and enable the development of new drugs targeting this enzyme. This has significant implications for treating bacterial infections and other diseases associated with polyphosphate metabolism dysregulation. Overall, this research has the potential to advance the development of new therapeutics against various diseases.

PP81. IMPORTANCE OF MOLECULAR MARKERS

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ABSTRACT

Orchidaceae is highly advanced and most complex family of flowering plants; it comprises approximately 28,000 species worldwide and hence constitute one of the largest families of flowering plants. Besides their floricultural significance, they are medicinally important as well. Orchid species are generally difficult to identify, as these are classified primarily based on floral morphology which changes with pollinator preferences. In India, most of the orchid habitats are dwindling in state due to many anthropogenic activities, such as habitat destruction and fragmentation, landscape development, river valley projects, and other infrastructural

developments. Therefore, in such situations molecular systematic (which involves utilizing DNA regions from the mitochondrial, plastid, and nuclear genomes) plays decisive role for better understanding, inferring phylogenetic relationships, and to classify Orchidaceae. As the marker-based techniques are laborious, time-consuming, and have many limitations. Thus, a rapid and cost-effective technique, such as DNA barcoding, is required for differentiation of these endangered species from the other species even if the material available is in vegetative stage or only a fragment of the tissue.

PP82. FOOD AND NUTRITION - A PERSPECTIVE ON WOMEN'S HEALTH

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ABSTRACT

Women's health is a multifaceted domain, influenced by various biological, social, and cultural factors. Adequate nutrition plays a pivotal role in safeguarding and enhancing the well-being of women across their lifespan. Nutrition during different life stages, such as pregnancy, lactation, adolescence, and menopause, significantly influences a woman's health trajectory. Proper nourishment during pregnancy, for instance, is crucial for both the fetal development and maternal health, reducing complications probability. Equally important is the postpartum period, where, nutrition aids in recovery and breastfeeding success. Beyond reproduction, nutrition remains paramount. A well-balanced diet rich in essential nutrients supports bone health, heart health, and overall vitality. Additionally, it can mitigate the risk of chronic conditions, including obesity, diabetes, and cardiovascular disease, which disproportionately affect women. The socio-cultural context also plays a crucial role. Access to nutritious food, education, and cultural practices impact a woman's ability to make healthy dietary choices. Empowering women with knowledge and access to nutritious food is essential to address these disparities. In conclusion, food and nutrition are cornerstones of women's health, with far-reaching implications for physical, emotional, and reproductive well-being. Recognizing these connections and addressing the unique nutritional needs of women is fundamental for promoting their health and longevity. This underscores the significance of a holistic approach to women's health that prioritizes nutrition as a key determinant.

PP83. BEE-WASHING - AN ANOTHER WAY OF GREEN-WASHING

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ABSTRACT

When a company seeks to appear greener, more sustainable, or ecologically friendlier than it is, it can be termed as Green-washing which is further labelled as Bee-washing when it spreads misinformation to the Public through the help of some organisations or by campaigning about increasing the honey bee population under "Save the bees" tag to draw attention to themselves & to brand their actions as sustainable. Honey-bees are our livestock but they do not represent all the bee species present globally. The urbanization, Climatic change, agro chemicals usage

have caused a serious decline in the number of native bee species worldwide. Also, the misinformation about "Save the bees" campaign focusing entirely on only Honey-producing bees caused invasion of the space of the other native/wild bees (eg. Solitary bees, some bumble bees). Bee-keeping is not Bee conservation. Thus, we need to work upon the underlying causes like Habitat loss and excessive pesticide use. To overcome these issues, establishment of "Bee-Hotels" and keeping the growth of our surroundings like gardens, parks etc more organic than chemically loaded, can be quite helpful. This problem needs to be addressed seriously and the very first step is to aware the public and debunk any sort of misinformation surrounding the science.

PP84. ROLE OF ARTIFICIAL INTELLIGENCE IN AGRICULTURE

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ABSTRACT

The United Nations FAO (Food and Agriculture Organization) states that the world population would increase by another 2 billion in 2050 while the additional land area under cultivation will only account to 4% at that time. In such circumstance more efficient farming practices can be attained using the recent technological advancements and solutions to current bottlenecks in farming. A direct application of AI (Artificial Intelligence) or machine intelligence across the farming sector could act to be an epitome of shift in how farming is practiced today. The agriculture sector faces numerous challenges in order to maximize its yield including improper soil treatment, disease and pest infestation, big data requirements, low output, and knowledge gap between farmers and technology. The new agricultural system must become more productive in output, efficient in operation, resilient to climate change, and sustainable for future generations. AI holds promise in addressing the challenges of this new paradigm. The main concept of AI in agriculture is its flexibility, high performance, accuracy, and cost-effectiveness.

PP85. CAUTION PACKAGED DRINKING WATER

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ABSTRACT

Packaged drinking water has become an indispensable part of modern life, quenching the thirst of millions of people worldwide. Numberless companies have emerged in recent years promising the co reliable, safe, and quality packaged drinking water. A study conducted at UT Chandigarh tried to investigate the reliability of bottled water in terms of the standards laid down by national and international organizations for healthy potable water for human consumption. The water available in packed bottles, both at room temperature (A) and in the refrigerator (B), from various pockets of Chandigarh, was tested for TDS, TH, pH, Ca, and Mg by using standard methods. The average values of these parameters were [TDS- 67.625 mg/L, TH- 113.89 mg/L, pH- 8.566, Ca- 16.67 mg/L, Mg- 17.33 mg/L] respectively.

Refrigeration was found to lower the TDS of water by 10-15 points [55.33 mg/L]. Most of the commercially available bottles neither had printed information regarding these parameters nor were found to follow the standards as laid down by national and international organizations. BIS has prescribed the ideal range of 150-300 mg/L for TDS in drinking water for human consumption. None of the company's water samples available in the city were found to adhere to these norms, except Bisleri whose water was near to the recommended limits of TDS. The findings of this study reveal critical insights into the reliability of packaged drinking water. All commercially available bottled water is HYPOMINERAL, and its unregulated consumption will lead to a great threat to public.

PP86. THE AGE-DEFYING POTENTIAL OF STEM CELL RESEARCH

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ABSTRACT

Stem cells are undifferentiated cells with the unique ability to develop into various specialized cell types. They play a crucial role in tissue repair, regeneration, and maintenance throughout an individual's life. Stem cells hold significant potential for anti-aging research and therapies. As we age, the number and functionality of stem cells in our bodies tend to decline. This decline is associated with a reduced ability to repair and regenerate damaged tissues, contributing to the aging process. The anti-aging gene like Klotho, Prop-1, Pit H etc. plays vital role and are one of the major factors. Also, the transplantation of hematopoietic stem cells can come in to play. Other factors which affect the aging process including immune aging are length of telomerase, calorie intakes, expression of growth factors etc. Stem cells in conjugation with anti-ageing genes probably receive and neutralize most of the devastating signals which are known cause of premature ageing. The shield of stem cells combined with anti-ageing genes is a primary target for absorbing the shock of ageing. If this shield neutralizes the shocks, it can lead to a youthful state and will also not accelerate the ageing journey. Hence, it’s clear that stem cell has quite a good potential and promising results in aging i.e. slowing the process of senescence.

PP87. APPLICATIONS OF SELENIUM NANOPARTICLES

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[1]*Centre of stem cell and tissue engineering, Panjab University, Chandigarh*

ABSTRACT

Nanoparticles are tiny materials having sizes ranging from 1 to 100 nm. Nanoparticles possess unique physical and chemical properties due to their high surface area and nanoscale size. Due to this, they act as great scaffolds in tissue culture and regenerative medicine. One of such Nanoparticles is that of selenium. Selenium is a trace and essential micronutrient for the health of humans, animals, microorganisms, etc. and recently it has become a great field of interest for researchers due to its biocompatibility, bioavailability, and low toxicity. It has shown great potential for curing disorders like arthritis, cancer, diabetes, and nephropathy with potential therapeutic benefits. SeNPs constitute an attractive carrier platform to ferry various drugs to

the site of action. It also shows remarkable anti-cancerous properties because of its inhibitory effect on kinase activity thus preventing drug resistance. It can be used in fields of agriculture, and food technology, as fertilizers and as supplements, etc.

PP88. STEM CELLS AS REGENERATIVE MEDICINE FOR NEURAL DISORDERS.

Yashreet Kaur Basra[1]

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ABSTRACT

Stem cells have the ability to self-renew and differentiate. Depending on their capacity to differentiate, stem cells can be categorized into totipotent (can give rise to embryonic as well as extra embryonic layes), pluripotent (differentiate into cells of three germ layers), multipotent (can differentiate into multiple cell lineages of the same germ layer), Unipotent (can differentiate into one cell type). Their excellent ability to self-renew and differentiate could be exploited in regenerative medicine. There are various types and sources from where stem cells could be derived but the multilineage differentiation potential, high proliferative capacity and promising therapeutic values of mesenchymal stem cells make them a potent candidate in approach for regenerative medicine. This review mainly discusses about use of various types of stem cells, specifically mesenchymal stem cells in the treatment of various neural disorders like Alzheimer's disease, Parkinson's disease, and many other disorders. This review proceeds on to examine the difficulties and challenges that are faced and must be solved in order to use stem cells in regenerative medicine.

Mathematical Sciences

- Mathematics
- Statistics
- Computer Sciences

CO-ORDINATORS

Dr. Anju Goyal

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CHASCON – 2023

National Conference on

Global Science for Global Wellbeing

SECTIONAL PROGRAMME (OCTOBER 13, 2023)
MATHEMATICAL SCIENCES
Venue: Seminar Hall, Department of Statistics, Panjab University, Chandigarh

Sectional President Dr. Anju Goyal 9876159438	**Sectional Secretary** Dr. Sudhir Goyal 9877033057
Time	**Program**
9:00 – 9:45	Display of Posters **Venue:** Corridor of Department of Mathematics, Panjab University, Chandigarh
9:45 – 10:00	Commencement of Program Venue: Seminar Hall, Department of Statistics, Panjab University, Chandigarh
10:00 – 10:45	**Session Chair:** Mrs. Suman Bala **Speaker:** Dr. Gaurav Prakash Additional Professor PGIMER, Chandigarh *"Understanding cancer! its cause, prevention and treatment"*
10:45 – 11:30	**Session Chair:** Dr. Rohini Sharma **Speaker:** Dr. Sanjeev Sofat Professor (CSE) PEC, Chandigarh *"Influence of Mathematics on Computer Science"*
11:30 – 12:00	Tea break
12:00 – 13:00	Poster Presentations (UG/PG/Faculty) **Venue:** Corridor of Department of Mathematics, Panjab University, Chandigarh Oral Presentation (Faculty) **Venues:** 1. Seminar Hall, Department of Mathematics, Panjab University, Chandigarh 2. Seminar Hall, Department of Statistics, Panjab University, Chandigarh 3. Lab II, DCSA, Panjab University, Chandigarh
13.00 – 14.00	Lunch
14.00 – 15.30	Oral Presentation (Research Scholars) **Venues:** 1. Seminar Hall, Department of Mathematics, Panjab University, Chandigarh 2. Seminar Hall, Department of Statistics, Panjab University, Chandigarh 3. Lab II, DCSA, Panjab University, Chandigarh
15.30 – 16.00	Tea break
16.00 onwards	Oral Presentation (PG Students/Research Scholars) **Venues:** 1. Seminar Hall, Department of Mathematics, Panjab University, Chandigarh 2. Seminar Hall, Department of Statistics, Panjab University, Chandigarh 3. Lab II, DCSA, Panjab University, Chandigarh

ABSTRACTS OF ORAL PRESENTATIONS

PARTICIPANTS

S. No.	Name of participant	Affiliating institution	Title of abstract
1.	Anju Goyal	Panjab University, Chandigarh	Stratification in PPS sampling using Zipf's law and RHC design
2.	Jagjit Singh	UIET, Panjab University, Chandigarh	Some matrix inequalities involving matrix means and applications to Kadison's type inequalities
3.	Rohini Sharma	DCSA, Panjab University Chandigarh	An overview of tools and techniques of extractive text summarization
4.	Suman Bala	Department of Mathematics, Panjab University, Chandigarh 160014, India	A linear theory of thermoelastic relaxed micromorphic material with voids
5.	Surinder Pal Singh Kainth	Department of Mathematics, Panjab University Chandigarh	Non-absolute integration and its applications
6.	Mona Narang	D.A.V. College, Sector 10, Chandigarh, 160010, India	A class of geometrically constructed fixed point iterative scheme with strong convergence
7.	Savkirat Kaur	Department of Mathematics, Dev Samaj College for Women, Chandigarh,	Effect of void pores on the propagation of love-type surface waves through a stratified elastic media
8.	Shivani Bedi	DAV College, Sector 10, Chandigarh	A three-way bijection between class of associated lattice paths, plane partitions and partitions with n copies of n
9.	Sumandeep Kaur	Department of Mathematics, Panjab University, Chandigarh	Discriminant and integral basis of certain number fields
10.	Dimple Rani	Department of Mathematics, Panjab University, Chandigarh	Strongly π-regular elements and Drazin inverses
11.	Jyoti Garg	Department of Mathematics, Panjab University, Chandigarh	A computational approach to Brauer Witt Theorem
12.	Hrithik Gupta	Panjab University	Prediction of multi diseases using machine learning

13.	Kshitij Kartik Mehta	Statistics , Panjab University	The current state of e-waste & strategies to counter it
14.	Muskaan Anand	Panjab University, Chandigarh	Microbial biotechnology and process optimization using response surface methodology
15.	Nancy Sheokand	Statistics	Understanding factual inaccuracies in ChatGPT: An investigation and solution
16.	Preeti	Department of Statistics, Panjab University, Chandigarh	Impact of chemicals on water quality
17.	Riya Mehta	Department of Statistics, Panjab University, Chandigarh	The environmental effects of chemical pollutants on water quality of different sources
18.	Shyam Sunder	Department of Statistics Statistics , Panjab University, Chandigarh	Reducing factual inaccuracies in ChatGPT: An investigation and solution
19.	Vijayveer Singh Rana	Department of Statistics, Panjab University, Chandigarh	Optimizing cancer treatment through statistical modeling and game theory: A timely approach to therapy and prognosis
20.	Anku	Department of Mathematics, Panjab University, Chandigarh	A class of geometrically constructed fixed point iterative scheme with strong convergence
21.	Anupama Goyal	Panjab University, Chandigarh	Stratification in modified PPS sampling using RHC design
22.	Anurag Kaur	Panjab University, Chandigarh	An efficient algorithm combining an optimized hybrid block method and the differential quadrature method for solving hunter–Saxton equation
23.	Jaswinder Singh	Panjab University, Chandigarh	Quantifying volunteer engagement in open-source database system development

24.	Mudita Kohli	Department of Computer Science and Applications, Panjab University Chandigarh	Analyzing intelligent behaviour of deep learning techniques for anomalous network packet detection
25.	Pragya Goyal	Department of Statistics, Panjab University, Chandigarh	Estimation of parameters for bounded dataset
26.	Puneet Kalra	Department of Statistics, Panjab University, Chandigarh, India	Exploring new statistical methods for genome-wide association studies
27.	Rajni Garg	Panjab University, Chandigarh	DBiTL: Enhancing cloud workload predictions for efficient resource allocation
28.	Sukhbir Kaur	Department of Statistics, Panjab University, Chandigarh	Estimating mixed data sampling (MIDAS) regressions for variables contaminated with measurement error
29.	Vaishali Mehta	Department of Computer Science and Applications, Panjab University, Chandigarh	Bio-inspired load balancing strategies for enhanced cloud resource management: A comparison
30.	Vinod Jaspa	Author	Unveiling the shadows: A comprehensive exploration of security vulnerabilities and impactful features in server-side hybrid applications
31.	Vinto Gujjar	DCSA, Panjab University, Chandigarh	State of the art review of word sense disambiguation for the Hindi language
32.	Akshita	Deptt. of Mathematics, Panjab University, Chandigarh	Stability of Rayleigh-B´enard convection with internal heat source
33.	Gurpreet Kaur	Department of Mathematics, Panjab University, Chandigarh	Thermal convection in vertical fluid layer with temperature dependent heat source
34.	Manisha	Department of Mathematics, Panjab University, Chandigarh - 160014, India	Wave propagation in generalized thermo-microstretch elastic solid containing voids

35.	Supinder Kaur	Department of Mathematics , Panjab University Chandigarh	Study of special type of multi-index problem
36.	Swati Bhardwaj	Department of Mathematics, Panjab University, Chandigarh	On a conjecture of Bambah, Dumir and Hans-Gill
37.	Aryan Thakur	Department of Statistics Panjab University, Chandigarh	Predictive analysis of road accidents in India

OP1. STRATIFICATION IN PPS SAMPLING USING ZIPF'S LAW AND RHC DESIGN

Anupama Goyal, Sangeeta Arora, Anju Goyal
Panjab University, Chandigarh

ABSTRACT

In Probability Proportional to Size sampling, the probability of selection of sampling units varies in proportion to its size. In literature, modification to PPS has been proposed by dividing the population in two groups on arranging the units in decreasing order of their frequency. In this paper, we propose to suggest some new estimators for Stratified Modified Probability Proportional to Size with Replacement (Stratified MPPSWR) sampling and Stratified Modified Rao-Hartley-Cochran (Stratified MRHC) design in case of without replacement sampling where the data are distributed in homogeneous strata such that it follows Zipf's law within each stratum and the units are selected using MPPSWR and MRHC design respectively. The relative efficiency of the proposed schemes is carried out and an illustration is given using the real data set. The proposed sampling schemes are seen to be more efficient than existing techniques.

OP2. SOME MATRIX INEQUALITIES INVOLVING MATRIX MEANS AND APPLICATIONS TO KADISON'S TYPE INEQUALITIES

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ABSTRACT

Let A and B be positive definite operators. Fujii et. al [3] proved the following equivalence relation: $\log B \leq \log A$ iff $A^{-r}\#_{\frac{r}{p+r}}B^p \leq I$ for all $p, r \geq 0$.

It is known as the essential part of the Furuta inequality [4]. We give a characterization of chaotic order via an arbitrary operator mean σ as follows. For $p, r > 0$, $\log B \leq \log A$ iff $A^{-r\alpha}\sigma_h B^{p\alpha} \leq I$ for all $\alpha \geq 0$, where A and B are positive invertible operators, h is a normalized operator monotone function on (0,∞) satisfying $h(t^s) \leq h(t)^s$ for all $t > 0, s \geq 1$ and $h'(1) = \frac{r}{p+r}$. It is a generalization of the well-known characterization of chaotic order by using operator geometric mean. As applications of the result, we generalize an asymmetric Kadison's inequality.

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OP3. AN OVERVIEW OF TOOLS AND TECHNIQUES OF EXTRACTIVE TEXT SUMMARIZATION

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ABSTRACT

Text summarization is a Natural Language Processing (NLP) task, which is used for extracting crucial information from the Original Text. It has applications in document analysis, content generation, information retrieval etc. It generates the summary of all the available data using various tools and techniques. There are mainly two types of text summarization i.e., Abstractive and Extractive. Abstractive methods are complex which rephrases the content to convey the main ideas of a text document in shorter form. Extractive text summarization selects sentences directly from the source text to form the summary. It does not involve the process of rephrasing. In this study we have focused on extractive text summarization techniques. We have discussed various existing techniques that are used in different phases of the extraction process. The pros and cons of each technique have been discussed along with the kind of applications where individual techniques are being used.

OP4. A LINEAR THEORY OF THERMOELASTIC RELAXED MICROMORPHIC MATERIAL WITH VOIDS

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ABSTRACT

In this paper, we present a linear theory for thermoelastic relaxed micromorphic material containing uniform distribution of voids. By constructing Helmholtz's free energy density function, constitutive relations are developed for anisotropic as well as isotropic linear thermoelastic relaxed micromorphic solid. Subjecting the law of balance of energy to invariance under the frame of reference, field equations are derived and its variants are investigated for one dimensional wave propagation. The dispersion relations have been obtained analytically and their dispersion curves are depicted graphically. Constitutive relations and field equations for thermoelastic relaxed micromorphic solid, relaxed micromorphic solid and thermoelastic solid with voids are obtained from present formulation as special cases.

OP5. NON-ABSOLUTE INTEGRATION AND ITS APPLICATIONS

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[1]*Department of Mathematics, Panjab University Chandigarh*

ABSTRACT

In elementary calculus, integration is defined in two different ways; as the limit of Riemann sums and the increment in the antiderivatives. A rigorous proof of the equivalence of these two approaches requires one to formally define the notion of integration. The first formal treatment to the theory of integration was provided by Riemann, which has been further refined by Lebesgue. However, both of these integrals do not admit any conditionally convergent integral. Over the past five decades, extensive research has been dedicated to this area, and the *Henstock-Kurzweil integral* has effectively surmounted nearly all the challenges in integration theory. The Henstock-Kurzweil (HK) integral is the best buddy for real functions as it extends the notions of Riemann, Lebesgue and improper integration. Even the American Mathematical Society recommends it to be introduced at undergraduate level. In this talk, we shall discuss the motivation and significance of the HK-integral, along with its applications and a comparative analysis with some other integrals. We shall see how a much better version of the Fundamental Theorem of Calculus follows immediately from the definition of this integral. If time permits, we shall discuss this integral on metric measure spaces.

OP6. A CLASS OF GEOMETRICALLY CONSTRUCTED FIXED POINT ITERATIVE SCHEME WITH STRONG CONVERGENCE.

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ABSTRACT

In this work, a new one parameter family of fixed point iterative method is proposed to approximate the fixed points of contractive type mappings. Further, we also extend this scheme to two step and three step fixed point iterative methods. Numerical experiments show that proposed iterative schemes are comparable with similar existing methods in the literature. Numerical results also show that proposed iterative schemes require less number of iteration and lesser C.P.U time to acquire the desired accuracy of required fixed point.

OP7. EFFECT OF VOID PORES ON THE PROPAGATION OF LOVE-TYPE SURFACE WAVES THROUGH A STRATIFIED ELASTIC MEDIA

Savkirat Kaur[1], Aarti Khurana[2], Sushil Kumar Tomar[3]

[1]Department of Mathematics, Dev Samaj College for Women, Chandigarh, [2]Department of Mathematics, Panjab University, Chandigarh, [3]J C Bose University of Science and Technology, YMCA, Faridabad, Haryana, India

ABSTRACT

Propagation of Love-type surface waves is investigated in a model of multilayered elastic solid half-space containing void pores. Using Haskell matrix method, the dispersion relations are derived for two situations of topmost boundary surface of the model: (a) when it is stress-free and (b) when it is rigid. For both the situations, there exist two fronts of Love-type waves that are dispersive in nature and propagating with distinct speeds. One of these wave fronts is analogous to that obtained for multilayered Cauchy elastic half-space, while the other front is new and appeared due to the presence of voids in the model. Effect of presence of void parameters and layer thickness is studied on the speeds of wave fronts and depicted graphically for a specific 2-layered model. Conditions of propagation for both the fronts of Love-type waves are derived analytically for 2-layered model. Comparison of dispersion curves corresponding to both these fronts is also depicted graphically for 2- and 3-layered models with stress-free boundary surface.

OP8. A THREE-WAY BIJECTION BETWEEN CLASS OF ASSOCIATED LATTICE PATHS, PLANE PARTITIONS AND PARTITIONS WITH N COPIES OF N

Shivani Bedi

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ABSTRACT

In this paper, a three-way bijection between Associated Lattice paths (Anand and Agarwal, Proc. Indian Acad. Sci. (Math. Sci.) Vol. 122, No.1, February 2012, 23-39), a class of plane partitions and a class of partitions with n copies of n is established. We shall use the correspondence between associated lattice paths and partitions with n copies of n and Agarwal's version of Bender and Knuth bijection (Bender and Knuth, J. Combin. Theory (A), 13, 1972, 40-54) to establish this bijection. As a result, we also get lattice path representation for a special class of partitions with n copies of n.

OP9. DISCRIMINANT AND INTEGRAL BASIS OF CERTAIN NUMBER FIELDS

[1]Sumandeep Kaur, [1]Sudesh Kaur Khanduja

[1]Department of Mathematics, Panjab University, Chandigarh

ABSTRACT

Computation of discriminant as well as integral basis of an algebraic number field has been one of the most important problems in algebraic number theory. This has attracted the attention

of several mathematicians who determined the discriminant and integral basis of various classes of number fields which are defined over the field Q of rational numbers by certain types of irreducible polynomials. In this lecture, we discuss this problem for the fields K=Q(theta) with theta a root of an irreducible trinomial f(x)=x^6+ax+b belonging to Z[x]. For each prime number p, we compute the highest power of p dividing the discriminant of K in terms of the prime powers dividing a,b and the discriminant of f(x). An explicit p-integral basis of K will also be given for each prime p. A simple method will be described to obtain an integral basis of K from these p-integral bases. This is a joint work with S. K. Khanduja.

OP10. STRONGLY II-REGULAR ELEMENTS AND DRAZIN INVERSES

Dimple Rani[1], Anjana Khurana[1], Dinesh Khurana[1]
Department of Mathematics, Panjab University, Chandigarh

ABSTRACT

Drazin inverses caught the fancy of mathematicians in a big way. A lot of papers were written calculating Drazin inverses of various types of elements and finding Drazin inverses of some elements in terms of Drazin inverses of others. Azumaya and Drazin respectively found the value of a^D in form (a^i)(x^j)for a strongly π-regular element a when a = (a^2)x and a = a^(n+1)x. In this, we aim to find an expression for a^D in the form a^ix^j when a^n = a^{n+k}x for any nonnegative integer n and positive integer k. We hope to give easier proofs of some known results as applications of these characterizations. For instance, we give an easy proof of the result that for two commuting Drazin invertible elements a, b of R, then a+b is Drazin invertible if and only if so is 1 + (a^D)b, where a^D is the Drazin inverse of a. Our proof is akin to the case when a and b are invertible.

OP11. A COMPUTATIONAL APPROACH TO BRAUER WITT THEOREM

Gurmeet Kaur Bakshi[1], Jyoti Garg[1]
[1]*Department of Mathematics, Panjab University, Chandigarh*

ABSTRACT

A classical theorem due to Brauer and Witt implies that every simple component of the rational group algebra $mathbb{Q}G$ of a finite group G is Brauer equivalent to a cyclotomic algebra containing $mathbb{Q}$ in its center. The precise description of this cyclotomic algebra is not available from the proof of the Brauer-Witt theorem and it has been a problem of interest to determine the same in view of its central role in the study of central simple algebras. Here, an approach using Shoda pair theory is described, which is quite efficient from computational perspective.

OP12. PREDICTION OF MULTI DISEASES USING MACHINE LEARNING

Hrithik Gupta, Avneet Kaur
Panjab University, Chandigarh

ABSTRACT

Advancements in healthcare technology have led to a wealth of patient data, presenting opportunities to enhance early disease detection and improve patient outcomes. Machine learning (ML) techniques have emerged as powerful tools in this domain, offering the potential to predict multiple diseases simultaneously. This abstract summarizes recent research efforts focused on the prediction of multi diseases using ML.This study highlights the significance of predictive modeling in healthcare, emphasizing the importance of early detection in preventing and managing diseases. Various ML algorithms have been employed to analyze diverse datasets.In conclusion, the application of machine learning for the prediction of multi diseases represents a transformative approach in healthcare. By leveraging large and diverse datasets, ML models have the potential to revolutionize disease prevention, early diagnosis, and treatment planning.

OP13. THE CURRENT STATE OF E-WASTE & STRATEGIES TO COUNTER IT

Kshitij Kartik Mehta, Prerna
Panjab University, Chandigarh

ABSTRACT

Electronic waste is a growing problem, India generated over 10 lakh tonnes of e-waste in 2021-22, and this number is only expected to grow. The recycling of e-waste is essential to protect the environment and human health, as e-waste contains chemicals like lead, arsenic, cadmium, mercury etc. However, the Problem is that recycling of e-waste in India is largely informal, and this sector lacks proper methods and infrastructure. This can lead to the release of hazardous materials into the environment, which puts a devastating impact on human health. This project investigates the current state of e-waste management in India and is based on the data of e-waste generation and the capacity of recycling units in each state. We use simple random sampling to select & investigate cost to operation efficiency of some e-waste management facilities. The findings of this project presents statistical methods to forecast the amount of electronic waste that will be generated, and the pace by which recycling facilities must be increased to cope up. Along with it methods to invest in to improve the formal sector of e-waste recycling and personal level measures that can help prevent this problem.

OP14. MICROBIAL BIOTECHNOLOGY AND PROCESS OPTIMIZATION USING RESPONSE SURFACE METHODOLOGY

Muskaan Anand, Anubhav Arora
Department of Statistics, Panjab University, Chandigarh

ABSTRACT

Microbial biotechnology is a critical field across industries, from pharmaceuticals to biofuels, where efficient production of valuable compounds is paramount. This presentation, authored by Muskaan Anand and Anubhav Arora from the Department of Statistics at Panjab University, explores the application of Response Surface Methodology (RSM) for process optimization in microbial biotechnology, enhancing yields, reducing costs, and promoting sustainability. We introduce RSM's systematic approach, beginning with experimental design, where factors impacting the process are varied within predefined ranges. Data collection emphasizes accuracy to build reliable models. Statistical analysis is conducted in R, fitting mathematical models, especially quadratic, to account for factor interactions. Response surface plots visualize factor-response relationships. RSM guides process optimization, identifying optimal conditions for maximum yield, which leads to economic and environmental benefits. Anand and Arora present real-world examples and results demonstrating RSM's efficacy in microbial biotechnology, emphasizing sustainability and waste reduction. In conclusion, this presentation authored by Anand and Arora highlights RSM's pivotal role in advancing microbial biotechnology, optimizing processes, and achieving higher yields for a sustainable future in various industries.

OP15. UNDERSTANDING FACTUAL INACCURACIES IN CHATGPT: AN INVESTIGATION AND SOLUTION

Nancy Sheokand, Shyam Sunder
Statistics

ABSTRACT

Objective and aim:- ChatGPT, a state-of-the-art conversational AI model, has transformed how we interact with automated systems. However, it is not immune to generating factual inaccuracies, which can lead to misinformation and erode trust. This project focuses on understanding and rectifying the issue of factual inaccuracies in ChatGPT's responses. Our project will be completed in following steps: 1. Error Analysis: We will meticulously examine the types and sources of factual inaccuracies produced by ChatGPT, categorizing them into different domains 2. Categories of experimenting:- Mathematics, Statistics, Physics, Chemistry, General Knowledge etc. We will browse around 250 questions of each domain on ChatGPT. 3. Fact-Checking: Cross checking of results from authentic sources 4. Compilation of Data, Analysing the data 5. Presentation and interpretation of results using graphs, diagrams, frequency distribution tables. Statistical tool/ methods to be used:- 1.Sampling 2. Probability 3. Data representation tools Result:- Still Working on it…

OP16. IMPACT OF CHEMICALS ON WATER QUALITY

Preeti, Riya
Panjab University, Chandigarh

ABSTRACT

The presence of chemical factories in industrial areas has raised concerns about their impact on water quality in neighboring ecosystems. The release of hazardous chemicals into water bodies can lead to bioaccumulation and biomagnification, potentially endangering organisms higher up the food chain. The project investigates the impact of chemical factories on water quality, emphasizing the ecological and health consequences. Through data analysis, it quantifies pollutant levels in nearby water bodies and assesses their influence on aquatic ecosystems and human well-being. Using statistical tools, we investigated the chemical substances playing major role in polluting the water also determined factory's contribution to water pollution.

OP17. THE ENVIRONMENTAL EFFECTS OF CHEMICAL POLLUTANTS ON WATER QUALITY OF DIFFERENT SOURCES

Riya Mehta, Preeti
Department of Statistics, Panjab University, Chandigarh

ABSTRACT

The presence of chemical factories in industrial areas has raised concerns about their impact on water quality in neighboring ecosystems. The release of hazardous chemicals into water bodies can lead to bioaccumulation and biomagnification, potentially endangering organisms higher up the food chain. Chemical factories can have a significant impact on water quality. The wastewater from these factories can contain a variety of pollutants, including heavy metals, toxic chemicals, and organic matter. These pollutants can damage aquatic life, contaminate drinking water supplies, and make water unsuitable for recreation. The project investigates the impact of chemical factories on water quality, emphasizing the ecological and health consequences. Through data analysis, it quantifies pollutant levels in nearby water bodies and assesses their influence on aquatic ecosystems and human well-being. Using statistical tools, we investigated the chemical substances playing major role in polluting the water also determined factory's contribution to water pollution.

OP18. REDUCING FACTUAL INACCURACIES IN CHATGPT: AN INVESTIGATION AND SOLUTION

Shyam Sunder, Nancy Sheokand
Department of Statistics, Panjab University, Chandigarh

ABSTRACT

ChatGPT, a state-of-the-art conversational AI model, has transformed how we interact with automated systems. However, it is not immune to generating factual inaccuracies, which can lead to misinformation and erode trust. This project focuses on understanding and rectifying the issue of factual inaccuracies in ChatGPT's responses. Our project will be completed in following steps: 1. Error Analysis: We will meticulously examine the types and sources of

factual inaccuracies produced by ChatGPT, categorizing them into different domains 2. Categories of experimenting:- Mathematics, Statistics, Physics, Chemistry, General Knowledge etc. We will browse around 250 questions of each domain on ChatGPT. 3. Fact-Checking: Cross checking of results from authentic sources 4. Compilation of Data, Analyzing the data 5. Presentation and interpretation of results Statistical tool to be used:- Sampling, Probability, Data representation tools Result:- Still working on it.

OP19. OPTIMIZING CANCER TREATMENT THROUGH STATISTICAL MODELING AND GAME THEORY: A TIMELY APPROACH TO THERAPY AND PROGNOSIS

Vijayveer Singh Rana[1]

[1]*Department of Statistics, Panjab University, Chandigarh*

ABSTRACT

Cancer continues to be a major global health challenge, necessitating innovative strategies to enhance treatment efficacy while minimizing the burden on patients and healthcare systems. This paper presents a novel approach that combines statistical modeling and applied concepts from game theory to optimize cancer treatment decisions. The objective of this study is to address the timely need for therapy and improve the prognosis of cancer patients by incorporating current stage of therapy into treatment decision-making processes. By basing the prognosis as a stochastic process, treatments as a dynamic game, we introduce a proactive approach to therapy adjustment. Game theory principles are then integrated into the decision-making process to formulate a strategic framework. This approach considers not only the patient's current state but also the evolving nature of the disease according to the assumed probabilities of progression, thereby allowing for adaptable and personalized treatment strategies. Our findings will contribute to the ongoing efforts to transform cancer care into a more precise, adaptive, and effective discipline.

OP20. A CLASS OF GEOMETRICALLY CONSTRUCTED FIXED POINT ITERATIVE SCHEME WITH STRONG CONVERGENCE

Anku[1], Mona Narang[2], V. Kanwar[3]

[1] *Department of Mathematics, Panjab University, Chandigarh,* [2] *D.A.V. College, Chandigarh,* [3] *University Institute of Engineering and Technology, Panjab University, Chandigarh*

ABSTRACT

In this work, a new one-parameter family of fixed point iterative method is proposed to approximate the fixed points of contractive type mappings. Further, we also extend this scheme to two-step and three-step fixed point iterative methods. Numerical experiments shows that proposed iterative schemes are comparable with similar existing methods in the literature. Numerical results also show that proposed iterative schemes require less number of iteration and lesser C.P.U time to acquire the desired accuracy of required fixed point.

OP21. STRATIFICATION IN MODIFIED PPS SAMPLING USING RHC DESIGN

Anupama Goyal, Sangeeta Arora, Anju Goyal
Panjab University, Chandigarh

ABSTRACT

The probability of selection of sampling units varies in proportion to its size in Probability Proportional to Size sampling. In literature, modification to PPS has been proposed by dividing the population in two groups on arranging the units in decreasing order of their frequency. In this paper, we propose to suggest some new estimators for Stratified Modified Probability Proportional to Size with Replacement (Stratified MPPSWR) sampling and Stratified Modified Rao-Hartley-Cochran (Stratified MRHC) design in case of without replacement sampling where the data are distributed in homogeneous strata such that it follows Zipf's law within each stratum and the units are selected using MPPSWR and MRHC design respectively. The relative efficiency of the proposed schemes is carried out and an illustration is given using the real data set. The proposed sampling schemes are seen to be more efficient than existing techniques.

OP22. AN EFFICIENT ALGORITHM COMBINING AN OPTIMIZED HYBRID BLOCK METHOD AND THE DIFFERENTIAL QUADRATURE METHOD FOR SOLVING HUNTER–SAXTON EQUATION

Anurag Kaur[1], V. Kanwar[1], Higinio Ramos[2]
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ABSTRACT

In this paper, the numerical solution of a mixed derivative type Hunter–Saxton equation is addressed. A given equation is discretized transforming it into a system of ODEs with the use of a cubic trigonometric B-splines based differential quadrature method. The system is further solved using a fifth-order optimized one-step hybrid block method. Three numerical illustrations validate the efficiency of the proposed scheme and show its better performance through very accurate results. Stability and convergence analysis are also performed.

OP23. QUANTIFYING VOLUNTEER ENGAGEMENT IN OPEN-SOURCE DATABASE SYSTEM DEVELOPMENT

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Panjab University, Chandigarh, Panjab University, Chandigarh, Sri Guru Gobind Singh College, Chandigarh

ABSTRACT

The community within an Open-Source Software (OSS) project is central to its success and long-term viability. It acts as a collective hub, bringing together a diverse group of contributors who contribute their unique skills and perspectives. This collaborative environment fosters innovation, maintains software quality through peer review, and gathers crucial user feedback.

Furthermore, a thriving community reduces dependence on individual developers or organizations, often giving rise to an entire ecosystem around the software. A robust and engaged project community is vital, as it ensures ongoing development, a wealth of expertise, and a feedback loop for user-driven enhancements. The present research introduces a model that analyses the strengths and weaknesses of an OSS project community. This model takes a metric-based approach, assessing various aspects of the volunteer community to provide a final quantitative score on its quality. The model has been implemented on ten database management system projects, and the project with the strongest volunteer community has been declared the winner. This model will assist project maintainers in identifying areas of weakness within the project community, allowing them to allocate additional resources for improving the overall volunteer community experience.

OP24. ANALYZING INTELLIGENT BEHAVIOUR OF DEEP LEARNING TECHNIQUES FOR ANOMALOUS NETWORK PACKET DETECTION

Mudita Kohli[1], Indu Chhabra[1]

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ABSTRACT

Anomalous Network Packet Detection is a dire security concern today. ChatGPT era, has emerged as a grave concern for computer scientists and programmers. The method of recognizing diverged network activity from typical behavior of network flows is known as anomalous network packet detection. As networks have expanded in terms of complexity and size, detecting outlier occurrences in such huge and complex networks has become crucial to retain integrity. Detecting threats quickly and accurately decides the success of any network flow. Hence, to ensure its reliable behaviour and capacity to model features, the latest deep learning models have emerged as a promising tool in recent years. Deep learning comprises numerous neural layers that reflect cognitive development. Developing an efficient anomaly detection system necessitates understanding the complicated procedure of imbalanced datasets, recognizing changing patterns, and identifying irregularities. The paper discusses the knowledgeable features of deep learning paradigm for various crucial network anomalies with respect to the influence of identification of network packet datasets and the methodologies through experimental research. After a detailed discussion about its various aspects, the open research issues are addressed and future options for deep learning-based systems to detect intrusions are suggested.

OP25. ESTIMATION OF PARAMETERS FOR BOUNDED DATASET

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[1]*Department of Statistics, Panjab University, Chandigarh*

ABSTRACT

Numerous biased estimators have been suggested to address the challenge of multicollinearity within the linear regression model. These estimators exhibit superiority over their unbiased counterparts due to their reduced mean squared error. Instances frequently arise in which

dependent variables adheres to a double bounded distribution, necessitating parameter estimation. Consequently, in pursuit of more dependable outcomes, a novel two-parameter estimator is introduced to tackle the issue of collinearity. To assess the efficacy and significance of the proposed estimator, a comparative analysis is conducted against established estimators and presenting the findings through mean squared error matrix.

OP26. EXPLORING NEW STATISTICAL METHODS FOR GENOME-WIDE ASSOCIATION STUDIES

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[1]Department of Statistics, Panjab University, Chandigarh, India

ABSTRACT

In genome-wide association studies (GWAS), we analyze the genetic variation across the entire human genome, searching for variations that are associated with observable traits or certain diseases. There are several inference challenges in GWAS, including the huge number of genetic markers to test, the weak association between truly associated markers and the traits, and the correlation structure between the genetic markers. The association between genotypes and phenotypes is established through Burden and non-burden tests. In the present work, we would like to explore new techniques through Sequential Kernel Association tests (SKAT). SKAT is also used to find rare and common variants associated with a disease. Before we apply this procedure the data is normalized through edgeR or Linear Models for Microarray (LIMMA) techniques. The choice of Kernel depends on the type of data, Gaussian Kernel for normal data and weighted linear kernel or machine learning methods for non-normal data. These techniques will be discussed in context of association between genotypes and phenotypes for GWAS studies. The identification of different traits or characters associated with a particular disease will also be explored.

OP27. DBITL: ENHANCING CLOUD WORKLOAD PREDICTIONS FOR EFFICIENT RESOURCE ALLOCATION

Rajni Garg[1], Indu Arora[2], Anu Gupta[1]

[1] Panjab University, Chandigarh, [2]MCM-DAV, Chandigarh

ABSTRACT

Cloud computing, a cornerstone of the IT industry, has ushered in numerous benefits for service providers and customers alike. Despite its advantages, cloud computing grapples with challenges, notably inefficient resource provisioning for dynamic workloads. Precise workload predictions are pivotal for efficient resource allocation and waste prevention. However, the high-dimensionality and variability of cloud workloads pose significant predictive hurdles. Existing methods, often rooted in regression or recurrent neural networks, struggle to capture long-term workload patterns. To surmount these challenges, we introduce an innovative supervised learning model, Deep Bi-directional Tune LSTM (DBiTL), tailored for cloud workload prediction. Carefully fine-tuned hyperparameters empower DBiTL to extract features effectively, harnessing both historical and future data to decipher intricate workload patterns. Leveraging a purpose-built Deep LSTM architecture and a meticulous

hyperparameter tuning process, DBiTL emerges as a formidable tool. Our approach employs a Bayesian-based search methodology to optimize critical hyperparameters, ensuring minimal prediction errors when forecasting CPU usage in VMs. This rigorous hyperparameter optimization underscores its pivotal role in enhancing prediction accuracy for dynamic cloud data center workloads. To gauge DBiTL's efficacy, we benchmark it against a spectrum of models, including statistical (ARIMA), machine learning (SVR, KNN), and deep learning approaches (Vanilla LSTM, Stacked LSTM). We employ number of performance metrics, such as RMSE, MAE, MAPE, R^2, and Huber Loss. Our comprehensive results reveal that our methodology consistently outperforms its counterparts, significantly improving prediction accuracy. We conduct extensive experiments, utilizing real-world data from bitbrain cloud data centers, spanning diverse CPU utilization scenarios.

OP28. ESTIMATING MIXED DATA SAMPLING (MIDAS) REGRESSIONS FOR VARIABLES CONTAMINATED WITH MEASUREMENT ERROR

Sukhbir Kaur[1], Kanchan Jain[1], Sukhbir Singh[2], Pooja Soni[3]

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ABSTRACT

In this paper, a Mixed Data Sampling (MIDAS) regression model is studied, which is employed in the situations where explained and explanatory variables are observed at different frequencies or mixed frequencies. This model is explored in context of variables being affected by measurement error contamination via OLS using polynomial parameter profiling. It is assumed that the errors-in variables are normally distributed. The effect of measurement error is demonstrated on parameter estimation by proving lack of consistency in the obtained estimators. Using corrected score function, new estimators have been obtained. These estimators are shown to be asymptotically consistent. A Monte Carlo simulations study is performed to assess the effect of sample size, number of lags and profiling parameter.

OP29. BIO-INSPIRED LOAD BALANCING STRATEGIES FOR ENHANCED CLOUD RESOURCE MANAGEMENT: A COMPARISON

Vaishali Mehta, Anu Gupta

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ABSTRACT

Cloud computing transforms modern technology through efficient resource utilization, cost reduction, and the provision of scalable computing solutions. Efficiently allocating and optimizing computing resources is vital in cloud environments to meet the diverse demands of various applications. How efficiently these demands are fulfilled relies on proficient load-balancing schemes. In the realm of cloud computing load balancing is crucial for ensuring reliability and optimal resource utilization. The study underscores the necessity for robust load-balancing mechanisms to enhance Quality of Service (QoS) metrics and user experience.

Given the NP-hard nature of load balancing and scheduling problems, the paper advocates the adoption of Bio-Inspired meta-heuristic algorithms in dynamic cloud environments. The study compares the performance of Ant Colony Optimization, Artificial Bee Colony, Genetic Algorithm, Particle Swarm Optimization, and Firefly Algorithm. The comparison is done using the widely adopted simulation tool CloudSim. The results demonstrate variations in response times for executing the given tasks. Through a comparative analysis of popular Bio-Inspired algorithms, the research highlights their distinct strengths and limitations. The findings underscore the importance of algorithm selection based on specific load balancing requirements and available cloud resources, advocating for a comprehensive approach to optimize cloud performance.

OP30. UNVEILING THE SHADOWS: A COMPREHENSIVE EXPLORATION OF SECURITY VULNERABILITIES AND IMPACTFUL FEATURES IN SERVER-SIDE HYBRID APPLICATIONS

Vinod Jaspa[1], Rajinder Singh[2]

[1,2]*Authors*

ABSTRACT

Server-side hybrid applications (SSHAs) are a type of web application that combines the features of native and web applications. They are developed using HTML, JavaScript, and CSS, and can be run on different platforms. SSHAs have become a popular choice for developers and organizations due to their rapid development and deployment times, as well as their cross-platform compatibility. Some of the most famous apps that are built on SSHAs include Uber, Twitter, and Airbnb. However there are some of the security flaws, such as data breaches, code injection, and session hijacking which needs scrutiny and developer's awareness. In this research paper, we will thoroughly inspect features, tools, frameworks and various security concerns associated with SSHAs. We will thoroughly understand the security features that come with it. In the end of this paper, we will give a most adaptable solution for developers to make it more secure and safe.

OP31. STATE OF THE ART REVIEW OF WORD SENSE DISAMBIGUATION FOR THE HINDI LANGUAGE

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ABSTRACT

WSD is a technique used to find the most appropriate meaning for a word in a particular context, especially when a word is ambiguous. A lot of work has been done for English WSD, but it remains a challenge for languages with limited resources, such as Hindi. Therefore, addressing ambiguity in Hindi is essential for effective and efficient use of WSD on web for various applications like machine translation, information retrieval etc. Hindi has a rich linguistic structure, with many morphological variations and nuances in its syntax. This makes

it difficult to accurately determine the intended meaning of a word within the given context. In this review paper, various approaches to resolve ambiguity in Hindi words, such as supervised method, unsupervised method, knowledge-based method, etc. has been discussed. It also discusses about various applications, literature review, some open problems, conclusion and future work in this area.

OP32. STABILITY OF RAYLEIGH-B´ENARD CONVECTION WITH INTERNAL HEAT SOURCE

Akshita[1], Gurpreet Kaur[1], Renu Bajaj[2]

[1] Deptt. of Mathematics, Panjab University, [2] Panjab University, Chandigarh

ABSTRACT

Thermal convection in a viscous fluid layer with internal heat source has been subject of great interest among researchers due to its wide range of applications in many fields. We have considered the effect of internal heat sources in a horizontal fluid layer with boundaries of the layers maintained at different constant temperatures. The Shooting method is applied to investigate the linear stability of basic flow of the system un- der consideration. The effect of internal source parameters on the critical values of thermal Rayleigh number Ra has been considered.

OP33. THERMAL CONVECTION IN VERTICAL FLUID LAYER WITH TEMPERATURE DEPENDENT HEAT SOURCE

Gurpreet Kaur[1], Akshita[1], Renu Bajaj[2]

[1] Department of Mathematics, Panjab University, [2] Panjab University, Chandigarh

ABSTRACT

Due to its numerous uses across a wide range of fields, researchers have shown a keen interest in thermal convection in a viscous fluid layer with temperature dependent heat source. In a vertical fluid layer with the boundaries maintained at different constant temperatures, the impact of temperature dependent heat source has been taken into consideration. The linear stability of the system's basic flow is examined using the collocation approach utilizing Chebyshev polynomials. On the critical values of the thermal Rayleigh number Ra, the influence of the Prandtl number Pr and internal source parameters has been taken into consideration.

OP34. WAVE PROPAGATION IN GENERALIZED THERMO-MICROSTRETCH ELASTIC SOLID CONTAINING VOIDS

Manisha[1], Dilbag Singh[1], S. K. Tomar[2]

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ABSTRACT

Formulate a linear theory of generalized thermo-microstretch elastic solid containing voids. The thermal effects have been incorporated using one relaxation time concept introduced by

Lord and Shulman. The constitutive relations and the field equations are derived for an isotropic, homogeneous, generalized thermo-microstretch elastic solid containing voids. The possibility of propagation of plane waves is investigated in the medium of infinite extent. It is found that there may exist four sets of coupled longitudinal waves, two sets of coupled transverse waves and an independent longitudinal microrotational wave traveling with distinct speeds. Numerical computations have been carried out for a specific model and observed the metamaterial-like effect in this medium.

OP35. STUDY OF SPECIAL TYPE OF MULTI-INDEX PROBLEM

Supinder Kaur[1]

[1] *Department of Mathematics, Panjab University Chandigarh*

ABSTRACT

Motivated by the hierarchical system in transportation problems, this paper discusses a two-level time minimization solid transportation problem (2l-STP) in which the transportation of different kinds of products is done in two phases depending upon the preferences of vari- ous transportation links. Due to the hierarchical structure of the transportation system, the whole set of source-destination links is divided into two disjoint sets namely Level-1 (pre- ferred links) and Level-2 (non-preferred links). To solve the problem, an iterative algorithm is proposed that solves a restricted solid transportation problem at each iteration. The pro- posed algorithm uses the technique of sensitivity analysis to solve intermediate restricted problems which makes the algorithm computationally efficient. A two-dimensional two-level transportation problem is discussed as a special case of two-level solid transportation problem. The study is supported by theoretical results and numerical examples.

OP36. ON A CONJECTURE OF BAMBAH, DUMIR AND HANS-GILL

Swati Bhardwaj[1], Madhu Raka[1]

[1] *Department of Mathematics, Panjab University, Chandigarh*

ABSTRACT

Let Γ_{r,n−r} denote the infimum of all numbers Γ > 0 (existence of which is ensured by Blaney(1948)), such that for any real indefinite quadratic forms in n variables of type (r, n−r), determinant D≠0 and real numbers c1, c2, • • •, cn there exist integers x1, x2, • • •, xn satisfying 0 < Q(x1 + c1, x2 + c2, • • •, xn + cn) ≤ (Γ|D|)^{1/n} Bambah, Dumir and Hans-Gill in a series of papers (1981,1983,1984) proved that Γ_{r,s}=2^n/(|σ|+1) for −1 ≤ σ ≤ 3. They (1984) conjectured that Γ_{r,s} ={ (2^n/(|σ|+1) if |σ|≤3 and; 2^n/σ if σ=4 } except for a finite number of exceptions. From a series of papers, values of Γ_{r,n−r} are known for all n and r, except for Γ_{1,4}. It is conjectured that Γ_{1,4}=8. In 1971, Jackson proved that 8 ≤ Γ_{1,4} ≤ 32. Later, in 1994, upper bound was reduced to 16 by V.C. Dumir and Ranjeet Sehmi, and in 1997, it was improved to 12 by Madhu Raka and Urmila Rani. Here, we prove that Γ_{1,4} = 8 when c2 ≠ 0 (mod 1) and in some particular cases of c2 ≡ 0 (mod 1) also. In the remaining cases, we managed to prove Γ_{1,4} < 32/3.

OP37. PREDICTIVE ANALYSIS OF ROAD ACCIDENTS IN INDIA**

Aryan Thakur[1], Ashish Thakur[1]

[1] *Department of Statistics Panjab University, Chandigarh*

ABSTRACT

In this presentation, we will begin by outlining the scope and significance of the problem, emphasizing its impact on individuals, communities, and society at large. We will then delve into the collected data, which includes statistics on accident frequency, severity, and contributing factors. Through compelling visuals and informative narratives, we will highlight trends and patterns within the data, allowing for a deeper understanding of the issue. Furthermore, we will provide insights into the various factors that contribute to road accidents, such as distracted driving, speeding, impaired driving, and road infrastructure deficiencies. This analysis will serve as a foundation for proposing evidence-based solutions and interventions aimed at improving road safety. By the end of this presentation, the audience will have a clear understanding of the road accident landscape, its challenges, and the potential for positive change. We will conclude with a call to action, encouraging individuals, communities, and policymakers to collaborate in the pursuit of safer roads for all. Together, we can reduce road accidents, save lives, and create a better future.

ABSTRACTS OF POSTER PRESENTATIONS

PARTICIPANTS

S. No.	Name of participant	Affiliating institution	Title of abstract
1.	Sudhir Goyal	Department of Statistics, Panjab University, Chandigarh	Cloud computing for data scientists
2.	Parul, Pallavi	Department of Statistics, Panjab University, Chandigarh	Allocation problem/transportation problem
3.	Osheen Sahni	Panjab University, Chandigarh	"From data to intelligence: An introduction to machine learning, big data and AI"

PP1. CLOUD COMPUTING FOR DATA SCIENTISTS

Sudhir Goyal

Department of Statistics, Panjab University, Chandigarh

ABSTRACT

Cloud computing has become an essential tool for data scientists due to its scalability, flexibility, and accessibility. It has significantly reshaped the data science landscape by providing cost-efficient resources for processing, storing, and analyzing data. These cloud platforms grant immediate access to an extensive range of computing resources, encompassing CPUs, GPUs, memory, and storage, empowering data scientists to select resources aligned with their specific tasks, thereby optimizing their workflow. Additionally, data scientists can securely store, manage, and retrieve extensive datasets without the onerous upkeep associated with physical data centers. The accessibility of cloud computing extends data science resources to remote locations via a simple internet connection, facilitating collaboration, data access, and remote analysis. This enhances productivity and flexibility, enabling professionals to work from virtually anywhere. Furthermore, cloud computing offers heightened security compared to conventional data management methods. Proficiency in cloud computing equips data engineers and scientists with the means to safeguard their organization's data, protecting it from unauthorized access and potential breaches.

PP2. ALLOCATION PROBLEM/TRANSPORTATION PROBLEM

Parul, Pallavi

Department of Statistics, Panjab University, Chandigarh

ABSTRACT

The transportation problem is a classic optimization problem in operations research and logistics. It involves finding the most cost-effective way to transport goods from multiple suppliers to multiple consumers while satisfying supply and demand constraints. The objective is to minimize transportation costs while ensuring that supply and demand are balanced. This problem is often represented using matrices and solved using various optimization techniques, such as the simplex method or network flow algorithms. It has numerous real-world applications in supply chain management, distribution planning, and resource allocation. One common application of the transportation problem is in supply chain management, where it helps companies determine the optimal way to distribute products from manufacturing plants to distribution centers or retailers while minimizing shipping costs. It indicates the amount of consignment to be transported from various origins to different destinations so that the total transportation cost is minimized without violating the availability constraints and the requirement constraint.We considered a transportation problem of essential item rice from the different origins to different destinations and formulated the problem as a LPP model. We obtained an IBFS(initial basic feasible solution)to the problem by NORTH-WEST CORNER METHOD (NWCM) and VOGEL APPROXIMATION METHOD (VAM) and compared the results and displayed in the tables. The key idea in VAM is to minimize the best combinations of the solution to reach the optimal solution. The VAM can be used successfully to solve all different transportation problems in different areas of study.

PP3. "FROM DATA TO INTELLIGENCE: AN INTRODUCTION TO MACHINE LEARNING, BIG DATA AND AI"

Osheen Sahni

Panjab University, Chandigarh

ABSTRACT

Machine Learning, big data and artificial intelligence (AI) are transforming our day to day lives in numerous ways, often imperceptibly. These technologies are becoming increasingly integrated into various aspects of our daily routines, from personal tasks to professional endeavors. In the presentation we will explore the day-to-day applications of machine learning, big data and AI such as language translation, autonomous vehicles, healthcare diagnostics, E-commerce optimization and many more.

Pharmaceutical Sciences

- UIPS

CO-ORDINATORS

Dr. Ashwani Kumar

Dr. Sandip V. Pawar

CHASCON – 2023

National Conference on

Global Science for Global Wellbeing

SECTIONAL PROGRAMME (OCTOBER 13, 2023)
PHARMACEUTICAL SCIENCES
Venue: UIPS, Panjab University, Chandigarh

Sectional President Dr. Ashwani Kumar 8437843949	Sectional Secretary Dr. Sandip V. Pawar 9860578580

Time	Program
9:00 – 10.00	Display of Posters – UG/PG and Research Scholars **Venue:** UIPS Lawns, UIPS, Panjab University, Chandigarh
10.00 – 10:30	Commencement of Program Venue: Lecture Hall-1, Extension Building, UIPS, Panjab University, Chandigarh
10:15 – 11.15	**Session Chair:** Professor V. R. Sinha **Speaker:** Prof. Dr. U. C. Banerjee, FIIChE, FIEI, FSESc, FBRSI Former Dean and Head Department of Pharmaceutical Technology (Biotechnology) National Institute of Pharmaceutical Education & Research Sector-67, S.A.S. Nagar, Mohali-160062, Punjab, India Emeritus Professor, Department of Biotechnology, Amity University Punjab 82A, IT City, International Airport Road, Mohali – 140306, India ***"The importance of chiral drugs in human life and greener ways to produce them"***
11:30 – 12:00	Tea break
12:00 – 13:00	Oral Presentations (Faculty) **Venue:** Lecture Hall-1, Extension Building, UIPS, Panjab University, Chandigarh Poster Presentations (UG/PG/Research Scholars) **Venue:** UIPS, Lawns, Panjab University, Chandigarh
13:00 – 14:00	Lunch
14:00 –15:30	Oral presentations (UG/PG/Research Scholars) **Venues:** 1. Lecture Hall-1, Extension Building UIPS, Panjab University, Chandigarh 2. Lecture Hall-2, Extension Building UIPS, Panjab University, Chandigarh Poster Presentations (UG/PG/Research Scholars) **Venue:** UIPS Lawns, UIPS, Panjab University, Chandigarh
15:30 – 16:00	Tea break
16:00 onwards	Oral presentations (UG/PG/Research Scholars) **Venues:** 1. Lecture Hall-1, Extension Building UIPS, Panjab University, Chandigarh 2. Lecture Hall 2, Extension Building UIPS, Panjab University, Chandigarh Poster Presentations (UG/PG/Research Scholars) **Venue:** UIPS Lawns, UIPS, Panjab University, Chandigarh

ABSTRACTS OF ORAL PRESENTATIONS

PARTICIPANTS

S. No.	Name of participant	Affiliating institution	Title of abstract
1.	Amita Sarwal	University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh	Business incubators
2.	Neelima Dhingra	University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh	Computational tools in drug discovery : Predictive insights to experimental design
3.	Ranjana Bhandhari	University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh	Exploring glutamate-dependent psychoneuroimmunology and the involvement of astrocytes in an experimental paradigm of Autism Spectrum Disorders (ASD)
4.	Sangeeta Pilkhwal Sah	University Institute of Pharmaceutical Sciences (UIPS), Panjab University, Chandigarh 160014, India	GC-MS analysis, in silico, in vitro and antidiabetic studies of leaf extract of Pongamia pinnata Pierre
5.	Vandita Kakkar	University Institute of Pharmaceutical Sciences (UIPS), Panjab University, Chandigarh 160014, India	Revolutionizing dermatitis care: Boosting efficacy and minimizing toxicity with tetrahydrocurcumin and tacrolimus topical ointment
6.	Ankan Sarkar	Panjab University, Chandigarh	Mechanistic role of glycolytic enzymes in vascular smooth muscle cell phenotypic switching and neointimal hyperplasia in the comorbid condition of diabetes
7.	Mansi Prashar	University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh, India-160014	Co-crystallization as a method for modifying finasteride properties: A comprehensive investigation

8.	Reena Jassal	Department of Pharmaceutical Sciences and Drug Research, Punjab University, Patiala, Punjab, India	Extracts of Clematis spp. exhibits anticancer potential
9.	Akshita Bhargav	University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh	Organ on a chip: Next generation experimental platform for drug development
10.	Jaspreet Kaur	Department of Pharmaceutics, University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh, 160014, India	Formulation and evaluation of nano-encapsulated tetrahydrocurcumin and tacrolimus ointment for psoriasis
11.	Muskan	University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh	Innovations in cancer nanotechnology: Current and emerging trends in drug delivery
12.	Aseem Chadha	Chitkara University	Scientific and health centric implications of glutathione
13.	Ayush Madaan	Chitkara College of Pharmacy, Chitkara University, Punjab	Intrinsic worth and formulation characteristics of nutricosmetics
14.	Monika	Chitkara College Of Pharmacy, Chitkara University Rajpura Punjab India	Unfolding the potential of bilosomes in vaccines delivery
15.	Parag	Chitkara College of Pharmacy, Chitkara University, Punjab	Formulation characteristics and regulatory aspects of neurocosmetics skin care products
16.	Smriti Arora	Chitkara College of Pharmacy, Chitkara University, Punjab	Exploring the benefits of propolis in wound healing: Mechanistic approach
17.	Trupti Dandekar	Chitkara college of pharmacy, Chitkara University, Rajpura Punjab	Regulatory guidelines on disposal of expired and unused medicines
18.	Ajay Kumar	University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh	Targeting Angiogenesis as Therapeutic Cure in Alzheimer's Disease

OP1. BUSINESS INCUBATORS

Amita Sarwal[1]

[1]*University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh*

ABSTRACT

A commercial enterprise incubator is an business enterprise established to accelerate the boom and achievement of an entrepreneur through numerous sorts of support. An incubator gives resources and services such as physical area, capital coaching, not unusual services and networking connections. Incubators mentor as well as offer business help and screen offerings. The new ventures are facilitated with the aid of making them aware of dangers and minimising the ability cost of screw ups. Business incubators play a key function in providing help to nascent marketers mainly on the initial ranges. Hence, they play the role of an accelerator for start-up ventures.

OP2. COMPUTATIONAL TOOLS IN DRUG DISCOVERY: PREDICTIVE INSIGHTS TO EXPERIMENTAL DESIGN

Neelima Dhingra[1]

[1]*University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh*

ABSTRACT

The development of new chemical entity (NCE) with potential therapeutic agents is one of the most complex and difficult process in the pharmaceutical industry. Millions of dollars, and use of animals has increased with the advancement of research and development in medical technology. Alternatives in silcio tools are available with integration of various computer models, bioinformatics tools, in vitro cell cultures, enzymatic screens and model organisms. Docking is one of the alternative approaches for screening of compounds before actually testing it on animals. It is the best option to predict the interaction of drug molecules towards particular receptors and has become of high interest to the scientific community to save time and money involved in the drug development process. Present session will round up some of the basic and interesting aspects of virtual search agents, and their applications in drug discovery by giving insight of case studies. Combination of the experimental knowledge with effective computational filtering and prediction of various aspects of drug-likeness would facilitates the rapid and cost-effective elimination of poor candidates, and focus to find drug like molecules.

OP3. EXPLORING GLUTAMATE-DEPENDENT PSYCHONEUROIMMUNOLOGY AND THE INVOLVEMENT OF ASTROCYTES IN AN EXPERIMENTAL PARADIGM OF AUTISM SPECTRUM DISORDERS (ASD)

Ranjana Bhandhari[1], Manasi Verma[1], Ankan Sarkar[1], Manish Jain[1], Jyoti K Paliwal[2], Bikas Medhi[3], Anurag Kuhad[1]

[1]University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh, [2]PhaEx Consulting, Gurgaon, [3] PGIMER, Chandigarh

ABSTRACT

Autism spectrum disorders (ASD) are a class of neurodevelopmental disorders that are manifested mainly in children, with the primary symptoms running the gamut from social/communication deficits and stereotypies (the so-called "core symptoms") to associated behavioral anomalies like anxiety, depression, and attention-deficit hyperactivity disorder (ADHD). While the pathomechanistic pathways involved in the disorder are not very well understood as yet, the role of neuronl inflammation in the same has been suggested. Nevertheless, the triggers giving rise to this neuroinflammation have not previously been explored in detail, so in the present study, we aimed at exploring the role of glutamate on these processes, potentially carried out through increased activity of inflammatory cells like astrocytes, and a decline in neuronal health. In our study, we made use of the chlorpyrifos-induced paradigm of ASD in rat pups. These pups were subjected to tests assessing their neonatal development and adolescent behaviours (social skills, stereotypies, sensorimotor deficits, anxiety, depression, olfactory, and pain perception). Markers for inflammation were assessed, and the expression levels of molecules involved in glutamate excitotoxicity, and neuroinflammation were also measured. Additionally, the expression of reactive oxygen species and markers of neuronal inflammation (GFAP) and function (c-Fos) were evaluated, along with an assessment of histopathological alterations. Through our findings, we have obtained conclusive evidence regarding the involvement of glutamate in neuroinflammatory pathways implicated in the development of ASD-like symptoms, as well as its ability to activate further downstream processes linked to neuronal damage.

OP4. GC-MS ANALYSIS, IN SILICO, IN VITRO AND ANTIDIABETIC STUDIES OF LEAF EXTRACT OF PONGAMIA PINNATA PIERRE

Sangeeta Pilkhwal Sah[1], Jaishree Swarnkar[1], Sandip Pawar[1], Devendra Mishra[2], Mukesh Lal Sah[3]

[1]University Institute of Pharmaceutical Sciences (UIPS), Panjab University, Chandigarh 160014, India, [2]Birla Institute of Applied Sciences, Bhimtal, Uttarakhand, 263136, India, [3]Department of Pharmaceutical Sciences, Sir J C Bose Technical Campus, Bhimtal Kumaun University, Nainital, Uttarakhand, 263136, India

ABSTRACT

Pongamia pinnata (L.) Pierre, (known as "Karanja") is traditionally used for many ailments. In the present study, its n-hexane, ethyl acetate and ethanolic leaf extracts were subjected to spectroscopic and chromatographic analysis followed by *in silico* docking against drug targets

of diabetes. The extracts were evaluated for *in vitro* antioxidant effect followed by antidiabetic effect in streptozotocin-induced diabetic rats. The GC–MS investigation revealed the presence of total 3, 7 and 30 compounds in n-hexane, ethyl acetate and ethanolic extracts respectively which comprised 72.85 %, 14.18 % and 56.27 % of the total extract respectively. Cyclopentasiloxane, decamethyl- and cyclohexasiloxane, decamethyl- were common in all the three extracts. In silico docking analysis against α-amylase and α-glucosidase enzyme demonstrated 24 potential compounds. The compound 2,7-diphenyl-1,6-dioxopyridazino[4,5:2',3']pyrrolo[4',5'-d]pyridazine exhibited lowest binding energies for both the targets with higher antidiabetic potential than the standard drug acarbose. Animals developed diabetes one week after STZ administration. However blood glucose decreased significantly after one week of treatment with ethanolic and ethyl acetate extracts, and two weeks with n-hexane extract and metformin. Ethanolic and ethyl acetate extracts produced more significant effect than the standard drug metformin. All the extracts demonstrated *in vitro* antioxidant effect with ethanolic extract displaying the best. The results correlated with the findings of histopathological studies showing improved kidney and pancreas architecture with all the three extracts. In nutshell the antidiabetic effect of P. pinnata leaf extracts could be attributed to antioxidant effect or to the effect of constituents on carbohydate metabolism, which warrants further studies.

OP5. REVOLUTIONIZING DERMATITIS CARE: BOOSTING EFFICACY AND MINIMIZING TOXICITY WITH TETRAHYDROCURCUMIN AND TACROLIMUS TOPICAL OINTMENT

Vandita Kakkar[1]

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ABSTRACT

Atopic dermatitis (AD) is a common chronic inflammatory skin disease with a complex pathophysiology and the lifetime prevalence of AD is estimated to be 10% to 30% in children and 2% to 10% in adults, with a two- or threefold increase over the past 3 decades in industrialized nations.Inspite of current therapies (i.e., topical corticosteroids (first-line) and/or topical calcineurin inhibitors and other over-the-counter drugs to manage the sleep disturbances and skin infections), AD is associated with potential and undesirable adverse effects. We proposed the combination of tetrahydrocurcumin (THC) lipidic nanoparticles (LNs) incorporated into an ointment with tacrolimus. The prepared THC-LNs were characterized for particle size, zeta potential, HRTEM, FTIR and THC-Tacro ointment was characterized for pH, rheology and occlusivity. Safety studies i.e., in vitro cell line studies (cell viability, quantitative analysis, and wound healing scratch assay) were performed using human dermal fibroblast (HDF).In vivo skin toxicity was performed and confirmed the non-toxic effects of formulation via histopathological studies. The combination of THC and tacrolimus ointment through topical application provides an efficient and commercially viable

alternative for dermatitis treatment, achieving a higher efficacy and potency with reduced toxicity.

OP6. MECHANISTIC ROLE OF GLYCOLYTIC ENZYMES IN VASCULAR SMOOTH MUSCLE CELL PHENOTYPIC SWITCHING AND NEOINTIMAL HYPERPLASIA IN THE COMORBID CONDITION OF DIABETES

Ankan Sarkar[1], Kanwaljit Chopra[1], Manish Jain[1]

[1]*Panjab University, Chandigarh*

ABSTRACT

Background: Arterial vessels comprise of multiple layers of cellular organisation including smooth muscle cells (SMCs). Abnormal SMC proliferation is a hallmark of spectrum of diseases including neointimal hyperplasia and atherosclerosis. During proliferation, SMCs require tremendous amounts of energy in the form of glucose. Recent studies have demonstrated that expression of PKM2 (a glycolytic enzyme) and PDK4 (involved in pyruvate oxidation) is upregulated during SMC phenotypic modulation. However, their role and mechanism in SMC proliferation is not fully established. The proposed study seeks to validate a novel mechanistic paradigm to understand how enzymes involved in energy metabolism regulate SMCs proliferation. A lucid understanding of energy metabolism and its consequences on VSMCs function could identify novel therapeutic targets common to both neointimal hyperplasia and diabetes. Methods: SMCs were isolated from rat aorta using collagenase digestion technique. SMCs were pretreated with specific inhibitors of glycolytic enzymes i.e., PDK4-IN and Shikonin and stimulated with platelet-derived growth factor (PDGF-BB). SMCs were analysed for functional changes such as proliferation (BrdU incorporation assay), migration (scratch assay), ROS generation (DHE labelling) and apoptosis (TUNEL assay). Results: PDGF stimulation led to SMC proliferation, migration and ROS generation. Simultaneously, number of apoptotic cells were significantly reduced. Furthermore, inhibition of PDK4 led to reversal of SMC functional changes induced by PDGF. Similarly, inhibition of PKM2 led to significant reduction in SMC proliferation, migration and intracellular ROS levels. These results suggest the important role of PDK4 and PKM2 in SMC proliferation. Conclusion: Inhibition of PDK4 or PKM2 attenuate rampant proliferative VSMCs.

OP7. CO-CRYSTALLIZATION AS A METHOD FOR MODIFYING FINASTERIDE PROPERTIES: A COMPREHENSIVE INVESTIGATION

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ABSTRACT

Co-crystallization, a versatile method in pharmaceutical formulation, has been employed to enhance the solubility and bioavailability of finasteride (FIN), a BCS Class II drug with limited aqueous solubility. The drug finasteride is used in the treatment of Benign prostatic hyperplasia (BPH), is a pathologic process which may contribute to lower urinary tract symptoms in aging men. This abstract focuses on the systematic preparation, comprehensive characterization, and thorough evaluation of the finasteride-hippuric acid co-crystal. Finasteride-hippuric acid co-crystals were synthesized using the liquid-assisted method, varying the molar ratios of finasteride to hippuric acid. Different analytical techniques, including differential scanning calorimetry (DSC), powder X-ray diffraction (PXRD), Fourier-transform infrared spectroscopy (FT-IR) confirmed the successful formation of the co-crystal, its structural arrangement was elucidated through the software Material Studio®. Increased solubility (2.40-folds), intrinsic dissolution rate (3.34-folds) and bioavailability (1.79-folds) studies suggested that the finasteride-hippuric acid co-crystal holds promise as a pharmaceutical formulation with enhanced therapeutic efficacy.

OP8. EXTRACTS OF CLEMATIS SPP. EXHIBITS ANTICANCER POTENTIAL

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ABSTRACT

Chemotherapeutic drugs induce number of toxic side effects and the demand for drugs with few side effects is a need of the hour. Clematis spp. is a wild species belonging to Ranunculacae family. Previously the plant has been shown to have analgesic and anti-inflammatory properties against ulcers The natural components have been proven to exhibit anticancer and invasive potential. Clematis erecta L. (Ranunculaceae) The methanolic extract as well as ethyl acetate fraction exhibited significant analgesic and anti-inflammatory activity. The literature still lacks the anticancer potential of Clematis spp. Therefore, it was envisaged to investigate the anticancer activities of Clematis spp. The study was done on C. erecta and C. gouriana. The results obtained suggest that C. erecta has anti-invasive potential on MDA-MB-231 cells. Interestingly, aqueous extract inhibits cell growth and also invasive ability by 40 and 50%, respectively. Further, the methanolic extract and ethylacetate fraction of the extract exhibit cytotoxicity in MCF7 and T47D cell lines. Colony forming assay and BrDU cell proliferation assay revealed that the treatment of the cells with extracts inhibits

proliferation. Ethyl acetate fraction reduced cell viability in breast cancer cell lines. The data suggested the future development of anti-cancer compounds from the plant.

OP9. ORGAN ON A CHIP: NEXT GENERATION EXPERIMENTAL PLATFORM FOR DRUG DEVELOPMENT

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ABSTRACT

Organ on a chip (OOC) is a miniaturized biomimetic system that involves interdisciplinary cooperation of biomaterial science, cell biology and engineering. Research today is majorly driven by in vitro cell cultures and in vivo animal models which fail to faithfully mimic the human physiology. This results in less accurate extrapolation of efficacy and toxicological studies and lack of predictability leads to failures of clinical trials which are very costly. To this end, OOCs offer a great advantage. We can get more effective mimic of native organs, control on environmental factors and effects of extracellular matrix for a hit to lead optimization, toxicology, physiological, pharmacokinetic studies, and phenotyping. OOCs are circuited to create human on a chip to understand organ cross talk and an adverse drug reaction. Organ specific pluripotent stem cells are taken on a chip to develop a tailored system which can be explored for the development of therapeutics. This technique develops a lung that breathes, a heart that beats and a gut that digests, on a chip to study different organs and the associated diseases. OOCs have been an impetus in cancer research and are becoming an integrated platform for cancer drug development. This presentation covers the application of lung on chip to study lung cancer and cystic fibrosis and other aspects of OOC including its fabrication, future aspects in disease modelling, its limitations and applications that makes it a more accurate, ethical, and humane research model.

OP10. FORMULATION AND EVALUATION OF NANO-ENCAPSULATED TETRAHYDROCURCUMIN AND TACROLIMUS OINTMENT FOR PSORIASIS

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ABSTRACT

Background and objectives: Psoriasis is a relapsing chronic widespread immune-mediated inflammatory disorder that affects approximately 0.44-2.8% of Indian population. The presence of visible dark patches and the itch profoundly impacts the psychological status of the patient thus affecting the quality of life and poses socioeconomic burden on their families. Current psoriasis treatment options are limited in effectiveness and related to multitude of problems, namely pain, organ toxicity and broadband immunosuppression, create a need for other innovative solutions. Tetrahydrocurcumin (THC), an excellent antioxidant and anti-inflammatory molecule was nanocoutured and incorporated into an ointment of tacrolimus, a potent calcineurin inhibitor for treatment of psoriasis. Methods: THC loaded lipidic

nanoparticles (THC-LNs) were prepared using micro-emulsification technique coupled with high-speed homogenization. Latter were characterized by particle size and zeta potential. Lyophilized THC-LNs and tacrolimus were incorporated into the ointment base and then characterized for FTIR, DSC, HRTEM and viscosity. Safety studies i.e., in vivo skin toxicity was performed in rat model. Results and conclusion: THC-LNs were prepared by micro-emulsification technique followed by high-speed homogenization. Particle size and zeta potential observed 185.3 nm and -7.0 mV respectively. The ointment was characterized for FTIR, DSC, HRTEM and viscosity and no physical interaction was found between the formulation components. In vivo skin toxicity was performed in rat model and formulation did not exert any toxicity to the skin. Proof of concept study against imiquimod induced psoriatic model revealed the enhanced bioactivity of THC post-incorporation into SLNs along with tacrolimus.

OP11. INNOVATIONS IN CANCER NANOTECHNOLOGY: CURRENT AND EMERGING TRENDS IN DRUG DELIVERY

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ABSTRACT

Cancer remains one of the most challenging and prevalent diseases worldwide, demanding novel approaches to improve the treatment outcomes while minimizing adverse effects. In the field of cancer therapy, nanostructured smart drug delivery systems have emerged as an innovative technique that provides precision targeting, controlled release, and personalized treatment alternatives. This abstract provides a comprehensive overview of recent advancements in nanostructured smart drug delivery systems for cancer therapy, highlighting their significant impact on patient care. Nanostructured systems, such as liposomes, polymeric nanoparticles, and dendrimers, have facilitated the precise drug delivery. These nanocarriers possess unique properties that allow the encapsulation of a wide variety of therapeutic agents, including immunomodulators, chemotherapeutics, and gene-based therapies. These nanocarriers use passive and active targeting mechanisms to selectively deliver drugs to cancer cells, minimizing damage to healthy tissues. Additionally, integrating stimuli-responsive systems enables real-time medication release that is triggered by variables like pH, temperature, or enzyme activity, improving therapeutic precision. As these systems continue to evolve, their potential in combating drug resistance, facilitating combination therapies, and expanding access to advanced cancer treatments becomes increasingly evident. In conclusion, recent advancements in nanostructured smart drug delivery systems for cancer therapy has brought in the new era of precision medicine with the potential to improve the prognosis and quality of life for cancer patients while also reducing toxicity and increasing therapeutic efficacy making it more patient centric.

OP 12. SCIENTIFIC AND HEALTH CENTRIC IMPLICATIONS OF GLUTATHIONE

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ABSTRACT

The 21st century has witnessed remarkable advancements in skincare, challenging past stigmas. Skincare is no longer exclusive to the elite or women; it's a widespread practice. Beyond aesthetic benefits, skincare products offer broader advantages. Glutathione, a tripeptide comprising cysteine, glutamate, and glycine, plays a vital role in intracellular redox balance, functioning as a powerful antioxidant. Depleted glutathione accelerates aging and contributes to neurodegenerative, pulmonary, immune, and cardiovascular diseases. Scientifically, glutathione's potential to reduce melanin production has garnered attention. It's increasingly administered for skin lightening and hyperpigmentation treatment, particularly among individuals with darker skin tones. Glutathione can shift between reduced and oxidized forms in the body, but their physiological differences and long-term safety remain uncertain. Glutathione's anti-melanogenic effects arise from several processes: favoring lighter pheomelanin over darker eumelanin production, antioxidant properties, and inhibition of the tyrosinase enzyme. This presentation focuses on glutathione's clinical implications in skin whitening, highlighting its global popularity, not just in India.

OP13. INTRINSIC WORTH AND FORMULATION CHARACTERISTICS OF NUTRICOSMETICS

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ABSTRACT

The pursuit of beauty and well-being has been an enduring aspect of human civilization, transcending cultures and epochs. The beauty industry has witnessed a paradigm shift with the emergence of nutricosmetics, a novel approach that underscores the intrinsic worth of nourishing the body from within to enhance external appearance. The presentation includes numerous examples of nutricosmetic industry, such as *lycopene*, which is a strong antioxidant extracted from tomatoes, used in formulation of *edible sunscreens*, and hyaluronic acid, used since ages for Botox and fillers. To enhance the bioavailability, various approaches were considered, such as nanoparticles and *liposomes*, which are microscopic lipid-based vesicles that can encapsulate various active ingredients, such as vitamins, antioxidants, and peptides. They improve the bioavailability of these compounds by protecting them from degradation in the digestive system and facilitating their absorption in the body. The burgeoning demands for nutricosmetics attribute to an increasingly health-conscious population gravitating towards products that align with their holistic well-being objectives. Nutricosmetics caters to this desire, offering a comprehensive approach that complements healthy lifestyles. Secondly, the advent of scientific advancements has bolstered the credibility of nutricosmetics. Research elucidating the role of certain nutrients in skin health, hair growth, and UV protection lent credence to the efficacy of these products, further driving their popularity. These products

exemplify a profound understanding of the symbiotic relationship between inner health and external beauty. As society continues to value authenticity and comprehensive well-being, the allure of nutricosmetics is poised to persist and shape the future of beauty

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OP14. UNFOLDING THE POTENTIAL OF BILOSOMES IN VACCINES DELIVERY

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ABSTRACT

Oral vaccines offer significant benefits due to the ease of administration, better patient compliance and non-invasive, needle-free administration. However, this route is marred by the harsh gastro intestinal environment which is detrimental to much vaccine formation. To address this, a range of delivery systems have been considered including vesicular drug delivery systems like liposomes, niosomes and bilosomes; bilosomes are bilayer vesicles constructed from non-ionic surfactants combined with the inclusion of bile salts which can stabilize the vesicles in the gastro intestinal tract by preventing membrane destabilization. The bilosomes stability and plasticity in the GIT facilitate the efficient carriage of drugs (such as antimicrobial, antiparasitic, and antifungal drugs), vaccines, and bioactive compounds to treat infectious agents. Bilosomes have the ability to induce both systemic and mucosal immune responses, making them suitable for wide range of vaccines targeting various pathogens. Ability to produce immune cell reaction by bilosome loaded vaccine or antigen even at low dose make them as versatile carrier systems over liposomes and noisome. The fast absorption of entrapped medicines in bilosomes through the intestinal mucosa to the portal circulation increases their bioavailability. Thus, Bilosomes represent a promising avenue for advancing the oral immunization strategies. Their unique structure and functional characteristics offers a means to overcome the various challenges and problems associated with oral drugs and vaccine delivery.

OP15. FORMULATION CHARACTERISTICS AND REGULATORY ASPECTS OF NEUROCOSMETICS SKIN CARE PRODUCTS

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ABSTRACT

Neurocosmetics, a burgeoning sector within the beauty and skincare industry, represents a fusion of neuroscience and cosmetic science. These products are designed to influence various aspects of the nervous system, aiming to enhance cognitive function, mood, and overall well-being while addressing traditional skincare concerns. Neurocosmetics encompass a wide range of products, including serums, creams, and supplements, formulated with ingredients intended to interact with the nervous system. The "modern" cosmetology sector is concentrating on research into innovative neurocosmetic functional components that may improve the interactions between the skin and the neurological system. These ingredients may include peptides, adaptogens, antioxidants, and neuromodulators. As the neurocosmetics market

continues to expand, a pressing need arises to examine the global regulatory landscape surrounding these innovative products. This abstract provides an overview of neurocosmetics and explores the evolving global regulations that govern their development, marketing, and sale.

OP16. EXPLORING THE BENEFITS OF PROPOLIS IN WOUND HEALING: MECHANISTIC APPROACH

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ABSTRACT

Propolis is a resinous combination that honey bees acquire from tree buds, sap flows, or other botanical sources for the purpose of sealing fissures, ensuring the smoothness of hive walls, preventing the infiltration of intruders into colonies, and maintaining optimal levels of moisture and temperature within the hive. Lately, there has been a significant use of beekeeping products within the realm of traditional medicine. The possession of diverse biological qualities can be attributed to the intricate chemical composition including terpenoids, triterpenoids, phenolic compounds, flavonoids, other organic compounds such as alkanes, fatty acids, including oleic acid, decanoic acid. Propolis has anti-inflammatory, antibacterial, antiviral, immunostimulant, and local anesthetic properties. Wound healing is a global public health concern, especially in chronic wounds due to delayed healing and susceptibility to bacterial infection. The therapeutic efficacy of propolis in healing wounds is attributed due to its antibacterial, anti-inflammatory, analgesic promoting activities. Propolis inhibits bacterial growth and prevents the production of biofilms. Propolis' anti-inflammatory activity is primarily due to the presence of numerous flavonoid, phenolic anti-inflammatory substances, such as caffeic acid, ferulic acid. It is a natural antioxidant due to presence of flavonoids, vitamin E and C and trace elements like zinc and selenium. The active element in propolis, caffeic acid phenethyl ester, can inhibit histamine release and the synthesis of inflammatory factors in wound healing. This abstract aims to explore the possibility of propolis in the field of clinical investigations and its mechanistic approach in wound healing.

OP17. REGULATORY GUIDELINES ON DISPOSAL OF EXPIRED AND UNUSED MEDICINES

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ABSTRACT

Pharmaceutical waste is defined as a waste containing medicines that are expired, contaminated, unused, and no longer needed, including items containing pharmaceuticals such as bottles, boxes, vials, ampules, gloves, and masks. Now a days the expired and unused medicines are becoming threat so there is a need of proper guidelines for the disposal of expired and unused medicines. Regulatory requirements for handling unused and expired medications are essential to maintain public health and environmental sustainability. These guidelines, put forth by regulatory and health groups everywhere, highlight a number of

important factors. These guidelines address the environmental effects of improper disposal, as many medications have the potential to affect water supplies and ecosystems. Responsible disposal methods like take-back programs and clear instructions for individuals are encouraged. Pharmaceutical companies are increasingly urged to take responsibility for the secure disposal of expired or recalled products, thereby reducing pharmaceutical waste and the potential for these products to enter illicit markets. These regulatory guidelines play a crucial role in safeguarding public health, preserving the environment, and promoting responsible pharmaceutical practices, with compliance being essential for the safe and sustainable handling of pharmaceuticals, benefiting both individuals and the planet.

OP18. TARGETING ANGIOGENESIS AS THERAPEUTIC CURE IN ALZHEIMER'S DISEASE

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ABSTRACT

Alzheimer's disease is a neurodegenerative disorder characterized by cognitive impairment. The FDA approval of Donepezil and Rivastigmine provoked researcher to study other pathways that led to the progression of this disease. Angiogenesis is an essential process in normal development and adult physiology but can be disrupted in numerous diseases like cancer, diabetic retinopathy and Alzheimer's disease, etc. Several families of regulators and neurovascular factors like TNF-α, integrin, VEGF, angiopoietin have been involved for its disruption in these disorders. Recent studies highlighted the increased level of VEGF, a hypoxia inducible angiogenic factor into the walls of intraparenchymal vessels, perivascular deposits and intrathecal space of Alzheimer's patients. The success of drug targeting VEGF bevacizumab opened the new avenue of targeting angiogenesis. However, many newly synthesized agents had not crossed clinical trials due to challenges like BBB and their toxicity profile. Hence, in future novel multi targeting agent with potential to cross BBB can be synthesized to target cognitive decline.

ABSTRACTS OF POSTER PRESENTATIONS

PARTICIPANTS

S. No.	Name of participant	Affiliating institution	Title of abstract
1.	Ashwani Kumar	University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh, India	Phytochemical evaluation of Lepidium sativum L. Seeds
2.	Jai Malik	University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh	Huntington's disease: Propitious role of ayurvedic drugs
3.	Jhalak Mehta, Sandip V. Pawar	University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh	Development, characterization and in-vitro evaluation of lignin-based hydrogel for antimicrobial applications
4.	Sandhya Jaiswal	Department of Pharmaceutics, Chandigarh College of Pharmacy, CGC, Landran, Mohal	Fabrication and optimization of nano enabled econazole for ocular delivery
5.	Ankit Bajpai	University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh-160014, India	Antimicrobial and anticancer potential of glycoconjugated coumarin triazoles: Synthesis and pharmacological evaluation
6.	Pankaj Kumar	University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh, India, 160014	Anti-malarial activity of solvent fractions of Xanthium strumarium, Bergenia ciliata, and Nicandra physalodes against Plasmodium berghei in mice
7.	Parveen Kumari	University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh, India, 160014	Topical nanoformulation of Aceclofenac for pain management
8.	Sunil Kumar	University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh	Toxicological evaluation of imidazo based pyridine/pyrazine- based heterocycles
9.	Zahid Ahmad Dar	University Institute of Pharmaceutical Sciences Panjab University Chandigarh	Insilco studies on novel 16-imidazolyl substituted steroidal derivatives as potent aromatase inhibitors

10.	Arun Kumar	Shoolini University of Biotechnology and Management Sciences	Design and docking studies of phenothiazine clubbed 1,2,3-triazoles derivatives with human topoisomerase IIA and aromatase
11.	Anil Kumar	University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh	Development of n-(benzothiazol/thiazol-2-yl)benzamide derivatives as quorum sensing inhibitors against Pseudomonas aeruginosa
12.	Shailza Changra, Arthi Thangaraj	University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh	From inception to advancements: The unfolding story of CAR T Cell therapy in cancer immunotherapy
13.	Barole Sachin Shamkant	University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh	Quality assessment of isoflavones containing tablets
14.	Chanchal Kumar	Panjab University	Synthesis and pharmacological evaluation of 1,4-dihydropyridines as neuroprotective agents
15.	Garima Puri, Kashish Pal	University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh	Neuromodulation devices for chronic pain management: Advances and applications
16.	Hasratjot Singh Saini	University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh	Biosensors for diagnosing and monitoring depression
17.	Komal Preet Kaur	University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh	Organ on a chip: New set up for human studies
18.	Kanade Krushna Devrao	University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh	Development and validation of stability-indicating analytical method of Ivacaftor by hyphenated UPLC and derivative spectrophotometry technique
19.	Manmeet Kaur Khanna	University Institute of Pharmaceutical Sciences, Panjab University, Sector 14, Chandigarh	Be-fast user-AI interface for early stroke detection

20.	Ritwik Sharma, Megha Chakraborty	University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh	Bioelectronic medicine - Next generation therapeutics
21.	Muskaan Singh	University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh	Nutraceuticals: An emerging trend
22.	Nandini	University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh	Virtual reality in pyschiatry
23.	Navdeep Kaur	Panjab University Institute of Pharmaceutical Science, Chandigarh	Phytochemical and antidepressants activity evaluation of Trillium govanianum
24.	Nitika Saini	Panjab University Institute of Pharmaceutical Science, Chandigarh	Development and evaluation of human amniotic membrane extract(hame) loaded nanoparticulate system
25.	Paavan	University Institute Of Pharmaceutical Sciences,Panjab University Chandigarh	Preparation and quantitative analysis of solid lipid nanoparticles (SLNS) of dexamethasone by FT-NIR spectroscopy
26.	Prabal, Richa Sharma	Authors	Conventional and modern treatments of Parkinson's disease
27.	Priyanshi Sharma	University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh	Identification and characterization of stress degradation products of Ivacafter by hyphenated LC-MS technique
28.	Rishita Sharma	University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh	Exploring the potential of electronic pills: A paradigm shift in healthcare monitoring and treatment
29.	Ritwik Sharma	University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh	Bioelectronic medicine – Next generation therapeutics
30.	Saswat Panda	University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh	Design, synthesis and evaluation of combined anti-dopaminergic and anti-serotonergic activities of aryl substituted imidazole

			derivatives as atypical antipsychotics
31.	Saurabh Bhansali	University institute of pharmaceutical sciences, Panjab University, Chandigarh	Phytochemical studies and evaluation of memory enhancing activity of Cuscuta reflexa and Cassythia filiformis L.
32.	Sayonika Goswami	University institute of pharmaceutical sciences, Panjab University, Chandigarh	Design, synthesis and evaluation of oxazole based potential cyclooxygenase inhibitors with antioxidant activity
33.	ShankhMani Bhai Patel	University institute of pharmaceutical sciences, Panjab University, Chandigarh	Systematic development and validation of analytical and bioanalytical UPLC method for simultaneous estimation of docetaxel (DTX) and curcumin (CMN) using analytical quality by design (AQBD) approach
34.	Shikha Goswami	University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh, India-160014	Daruharidra nano-formulation: Elevating therapeutic potential and memory enhancement
35.	Neha Mattoo, Shrey Kapoor	Department of Pharmaceutical Sciences, Panjab University, Chandigarh	Personalised medicine and pharmacogenomics: A promising approach to combat antimicrobial resistance
36.	Shristi Sharma	University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh	Microfluidic devices
37.	Sonali Das Gupta	University institute of pharmaceutical sciences, Panjab University, Chandigarh	Novel solid lipid nanoparticles for enhanced breast cancer treatment through targeted co-encapsulation of Docetaxel and Curcumin
38.	Soumyadeep Sarkar	University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh-160014	Optimization and evaluation of traditional NSAIDs for gastroprotection
39.	Sukhmani Sharma	University Institute of Pharmaceutical Sciences,	Wound healing- A latent global burden

		Panjab University, Chandigarh, India	
40.	Urvashi Atal	Division of Pharmacology, University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh 160014, India	Therapeutic potential of Allium sativum against the AB (1-40)-induced oxidative stress and mitochondrial dysfunction in the wistar rats
41.	Vatsla Tiwari	University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh	Development of N-(2- and 3-pyridinyl)benzamide derivatives as quorum sensing inhibitors against Pseudomonas aeruginosa
42.	Kaushal Sethi	Chitkara College of Pharmacy, Chitkara University, Rajpura, Punjab	Emerging techniques and new pharmaceutical approaches to confront antibiotic resistance
43.	Shagun Sharma	Department of Pharmaceutical Sciences, Shoolini University, Solan (HP)	Purine derivatives as anti-cancer agents
44.	Shreya Kad	Department of Pharmaceutical Sciences, Shoolini University	Recent advances of benzimidazole as an anti-cancer

PP1. PHYTOCHEMICAL EVALUATION OF LEPIDIUM SATIVUM L. SEEDS

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ABSTRACT

Lepidium sativum Linn. locally known as Garden cress is a fast-growing edible herb belonging to Brassicaceae family which is traditionally used for the treatment of hiccough, neuralgia and sprue. Phytochemical screening of *Lepidium sativum* seeds showed the presence of flavonoids, terpenoids, steroids, carbohydrates, glycosides, tannins, alkaloids, phenols, phytosterols, proteins and saponins. The total alkaloid content was estimated by gravimetric method. The total phenolic content, determined according to the Folin-Ciocalteu method, varied from 2.73 to 4.76 mg/g. The flavonoid content varied from 13.60 to 19.15 mg/g. A simple, precise, isocratic UPLC method was developed to determine the kaemferol content in the methanolic extract of L. sativum seeds. Mobile phase consists of UPLC-grade water with 0.1% ortho-phosphoric acid (OPA) and acetonitrile (70:30). The run time 5 min, whereas injection volume was 2 µL. Flow rate was 0.50 ml/min and detection wavelength were 270 nm. The kaemferol content varies from 2.50 to 2.81 mg/gm.

PP2. HUNTINGTON'S DISEASE: PROPITIOUS ROLE OF AYURVEDIC DRUGS

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ABSTRACT

Huntington's disease (HD) is an autosomal dominant neurodegenerative disorder that causes uncoordinated and involuntary muscular movements, chorea and dystonia, motor ataxia, gradual loss of nerve cells, cognitive decline, and other psychiatric disorders. Even after more than two decades of the discovery of the genetic causes of HD, its pathogenesis has not been very well established. Based on the available information on its pathogenesis, various studies have begun to rummage effective therapeutics. Ayurveda, is perhaps one of the oldest traditional systems of medicine practiced across the globe. It has a separate category of drugs under the name of 'Medhya Rasayana' (nervine tonic) for various nervous, especially neurodegenerative, disorders such as Alzheimer's disease, Huntington's disease, Parkinson's Disease etc. Various drugs, such as Brahmi, Ashwagandha, Shankhpushpi, Bach etc. have exhibited their potential in not only mitigating the effects of neurodegeneration but also in delaying their onset. The present paper will give an overview of anti-HD efficacy of some of the potent plants and their phyto-constituent (s) along with their proposed mechanism of action.

PP3. DEVELOPMENT, CHARACTERIZATION AND IN-VITRO EVALUATION OF LIGNIN-BASED HYDROGEL FOR ANTIMICROBIAL APPLICATIONS

Jaskiran Preet[1], Jhalak Mehta[1], Gurneha Kaur[1], Khushboo Pathania[1], Sandip V. Pawar[1]

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ABSTRACT

The increasing global issue of antibiotic resistance highlights the pressing requirement for innovative methods to combat bacterial infections. In this study, we present the development, characterization, and in-vitro evaluation of a novel lignin-based hydrogel as a promising platform for antimicrobial drug delivery. Oxytetracycline, a broad-spectrum tetracycline antibiotic, was incorporated into the lignin-based hydrogel to exhibit its antimicrobial properties. The lignin-based hydrogels were prepared using the freeze and thaw method, utilizing lignin and chitosan as the biopolymeric matrix, and polyvinyl alcohol and chondroitin sulfate as cross-linkers. Different techniques including FESEM, FTIR, and DSC along with the swelling index, moisture content, and degradation studies were employed for the characterization of the hydrogels' structural and morphological properties. In-vitro drug release studies demonstrated sustained and controlled release of oxytetracycline from the hydrogel with cumulative release of 25% and 13% in 48 hrs at pH 7.4 and 4, respectively. The released oxytetracycline exhibited significant antimicrobial activity against both gram-negative and gram-positive bacteria (*E.coli* and *S.aureus*) with higher potency against *S.aureus*. Furthermore, cytotoxicity towards the L-929 fibroblast cell line and hemotoxicity assays revealed the biocompatibility of the lignin-based hydrogel, highlighting its safety for potential biomedical applications.

PP4. FABRICATION AND OPTIMIZATION OF NANO ENABLED ECONAZOLE FOR OCULAR DELIVERY

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ABSTRACT

Fungal keratitis (FK) is an infection of eye which causes blindness or else ocular morbidity. Majority of antifungal drugs possess corneal bioavailability ranging from 1 to 5% because of the presence of corneal and non-corneal barriers. *Econazole* (ECN) is an antifungal (BCS class II drug) of the imidazole class. It acts by interacting with 14-α demethylase, a cytochrome P-450 enzyme necessary to convert lanosterol to ergosterol. Ergosterol is an essential component of fungal cell membrane, its inhibition results in increased permeability leading to leakage of cellular contents. Efficacy of ECN marketed product is limited to low bioavailability, frequent administration, and patient incompliance. The aim of the research was to fabricate and optimize nano enabled ocular gel for its antifungal activity. The analytical method was developed using HPLC with RT at 13.9 min. Formulation was prepared using solvent evaporation technique. In the technique, pre-emulsion was formed at 75°C followed by

homogenization and probe sonication. Process optimization was carried using JMP software. The optimized *NLCs* showed size diameter of 192.3nm, PDI 0.207 and zeta potential -44.8, which signifies the stability of nano-dispersion. 2% ocular gel exhibits 83.8% drug content. Entrapment Efficiency showed 66.9% drug was present on the surface and 18.2% in the core. Results of in-vitro release demonstrated that 86% release observed after 18 hrs. at pH 7.4. According to ICH guidelines (25°C temperature and 60% RH), *NLCs* were stable for 3 months. Thus, it was concluded that the developed nano enabled ocular gel possessed improved bioavailability.

PP5. ANTIMICROBIAL AND ANTICANCER POTENTIAL OF GLYCOCONJUGATED COUMARIN TRIAZOLES: SYNTHESIS AND PHARMACOLOGICAL EVALUATION

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ABSTRACT

The natural products coumarins possess diverse pharmacological effects such as anti-inflammatory, anticoagulant, antihypertensive etc. These effects could be enhanced by adding a glycoconjugated triazole group to the coumarin structure. Nowadays multidrug-resistant (MDR) microorganisms are a major global health concern. This study focuses on creating some novel coumarin triazolyl glycoconjugates labelled as 3a-f. These compounds were thoroughly characterized using spectroscopic techniques. The synthesis begins with a reaction between 7-hydroxy coumarin and propargyl bromide, resulting in a white solid compound 1 (7-(Prop-2-yn-1-yloxy)-2H-chromen-2-one), which is then reacted with protected deoxy-azido sugars derived from common sugars (glucose, galactose, xylose) using DIPEA and CuI in dry DCM to produce the final compounds 3a-f. The compounds demonstrated varying antibacterial activity against B. megaterium and E. coli. Notably, compounds 3d (7-((1-(2-(-6-(Benzyloxy)-2,2-dimethyltetrahydrofuran[2,3-d][1,3]dioxol-5-yl)-2-hydroxyethyl) 1H-1,2,3-triazol-4-yl) methoxy)-2H-chromen-2-one) was found most effective antibacterial agent with the zones of inhibition values of 36.66 ± 0.88 (10 µg/mL) and 34.33 ± 0.88 (20 µg/mL) against E. coli, and 17.66 ± 1.20 (10 µg/mL) and 20 ± 1.15 (20 µg/mL) against B. megaterium, surpassing the activity of chloramphenicol [36.33 ± 0.88 (10 µg/mL) and 38.66 ± 0.88 (20 µg/mL) against E. coli, and 25 ± 0.57 (10 µg/mL) and 25.33 ± 0.66 (20 µg/mL) against B. megaterium]. Compound 7-((1-((3,4,5-Tris(benzyloxy)-6-methoxytetrahydro-2H-pyran-2-yl)methyl)-1H-1,2,3-triazol-4-yl)methoxy)-2H-chromen-2-one) (3e) demonstrated moderate inhibition of leukaemia cancer cell lines. Molecular docking was conducted on protein 1DF7 with compounds 1 and 3a-f, revealing that all synthesized derivatives could bind with 1DF7. Compound 3d established π-π stacking interactions with Phe3 and exhibited other interactions like methotrexate

PP6. ANTI-MALARIAL ACTIVITY OF SOLVENT FRACTIONS OF XANTHIUM STRUMARIUM, BERGENIA CILIATA, AND NICANDRA PHYSALODES AGAINST PLASMODIUM BERGHEI IN MICE

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ABSTRACT

In recent years, the malaria parasite has developed resistance to almost all antimalarial drugs. There is a need to develop more effective antimalarial drugs that are affordable and traditional plants are the best option. The plants used in the present study are Xanthium strumarium, Bergenia ciliata, and Nicandra physalodes, which were identified, collected, dried, pulverized, and extracted using the soxhlet apparatus. In-vivo antimalarial study was done by performing Peter's four-day test. Chemosuppression was assessed on day 4 at 100, 250, and 500 mg/kg doses. On day 7, pharmacological evaluations such as necropsy, biochemical analysis, and histopathology were performed with the most active dose group i.e., 500 mg/kg. The 4-day chemosuppressive findings showed that XS 500, BC 500, and NP 500 have 77.1%, 68%, and 51% antimalarial activity. Necroscopic analysis showed normal organs in XS 500 and BC 500 while hepatomegaly and splenomegaly were observed in NP 500 group. Furthermore, plants fractions showed improvements in LFT, RFT, and PCV, which were supported by improved histopathological data of the liver, spleen, and kidney. The finding of the study suggests the oral administration of dichloromethane fraction of N. physalodes, X. strumarium, and the alkaloidal fraction of B. ciliata showed antimalarial activity by inhibiting the parasitemia in mice infected with Plasmodium berghei. These findings corroborated the ancient traditional knowledge and use of selected plants as an antimalarial agent.

PP7. TOPICAL NANOFORMULATION OF ACECLOFENAC FOR PAIN MANAGEMENT

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ABSTRACT

Current pain treatments involve the use of NSAIDs and narcotic analgesics however poor solubility and chances of gastrointestinal ulcers and bleeding, limits their use. The present research focuses on development of a topical Nanoformulation of aceclofenac via enhancing its solubility and reduction of its dose so as to diminish the related side effects. ACE-nanosuspension (ACE-NS) prepared by anti-solvent precipitation technique was characterized for particle size, PDI, zeta potential, total drug content, DSC, FTIR, P-XRD and FESEM.

Furthermore, spreadability, *ex-vivo* occlusivity, *in-vitro* release, *ex-vivo* skin permeation and retention, and stability studies were performed. ACE-NS showed particle size of 148 ± 15 nm with PDI: 0.170, zeta potential: 21.2 mV and total drug content of 86 ± 0.23%, respectively. DSC, FT-IR, P-XRD and FESEM studies revealed the thermal behavior, compatibility, solid-state characterization and morphology of ACE-NS. ACE-NS-loaded ointment showed a spreadability ratio of 0.23 and a drug content of 84 ± 1.15%. In-vitro release of ACE from nano-ACE-ointment (88.07%) was higher than the marketed formulation (70.55%) and free drug ointment (70.45%) after 24 hours. Release profile of nano-ACE-ointment fitted best for Higuchi model with r2 = 0.94 and n = 0.45 and its permeation flux was 9.2312 ± 0.8430 mg/cm2/h, which was significantly higher ($p \leq 0.05$) than ACE marketed gel (2.6158 ± 0.4352 mg/cm2/h). Cutaneous irritation and histological studies revealed no inflammatory skin lesions post-treatment with ACE-NS. Furthermore, ACE-NS-ointment showed a better analgesic effect than the marketed formulation in both the radiant tail-flick model and paw-licking animal models.

PP8. TOXICOLOGICAL EVALUATION OF IMIDAZO BASED PYRIDINE/PYRAZINE- BASED HETEROCYCLES

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ABSTRACT

Biphenyl, a structural motif commonly found in approved pharmaceutical drugs, exhibits a notable capacity to selectively bind to a diverse array of proteins. Fused imidazole, another structurally important entity, is prevalent in numerous bioactive compounds. In a recent investigation, the effectiveness of biphenyl scaffold combined with imidazole, fused with pyridine/pyrazine and thiazole frameworks, was assessed for potential anticancer activity against a selection of NCI-60 cancer cell lines, yielding promising results. (1) The objective of our study was to appraise the cytotoxicity, hemolytic activity, cell migration activity, DNA cell fragmentation activity, and in-vivo acute toxicity of derivatives of heterocycles based on imidazole. The cell viability in-vitro against HCT 116 Cell Line at doses of 10µM, 25µM, 50µM and 100µM displayed IC 50 ranging of 0.0301 ± 0.00158 for IG-01-007, 0.0309 ± 0.0106 for IG-01-008, 0.0275 ± 0.011 for IG-01-009, whereas no hemolysis was observed at the dose tested. At 100µm concentration all three compounds inhibit the metastasis activity of cancer cells after 24 hours of scratch in well plate so it can be evident that imidazo based heterocycles inhibit the migration capacity of colon cancer cells (DNA fragmentation result line). The in-vivo acute toxicity assays exhibited a significant toxicity at higher doses of ≥1000mg/kg indicated by hepatic damage and cholestasis in liver tissues by compounds IG-01-008 and IG-01-009.

PP9. INSILCO STUDIES ON NOVEL 16-IMIDAZOLYL SUBSTITUTED STEROIDAL DERIVATIVES AS POTENT AROMATASE INHIBITORS

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ABSTRACT

The present research delves into the development of 16-substituted steroidal imidazole derivatives as potential aromatase inhibitors for the treatment of breast cancer. Aromatase, a cytochrome P450 enzyme, is pivotal in converting androgens into estrogens during estrogen production. Our innovative approach of incorporating imidazole groups into the androstane nucleus aligns with the importance of azole group as a potent cytochrome P450 inhibitor, especially targeting aromatase. The allure of 16-substituted steroids lies in their diverse pharmacological properties, which are appealing to medicinal chemists who aim to develop novel compounds. Past literature has already signified several medicinally active steroidal derivatives with 16-position substitutions. Our recent work underlines the potential of 16E-arylidenosteroids as anti-tumor agents. This motivated us further to synthesize and evaluate 16-substituted steroidal derivatives possessing imidazole groups to identify potent aromatase inhibitors for breast cancer therapy. Previously we have successfully synthesized and assessed various steroidal derivatives. Notably, compounds 5, 6, 8, 9, 11, and 12 demonstrated moderate cytotoxicity across nine different cancer cell types. Moreover, compounds 6 (DPJ-RB-1241) and 7 (RB-401) emerged as potent aromatase inhibitors, surpassing the efficacy of standard drug exemestane by about 1.2 and 1.4 times, respectively. Molecular docking assessments of compounds 6 and 7 have unveiled robust binding affinities towards the aromatase enzyme, yielding docking scores of -7.40 and -7.50, respectively. Noteworthy interactions encompass a spectrum of hydrophobic, polar, and charged interactions. Importantly, compound 7 forms an additional hydrogen bonding interaction, which rationalizes its elevated affinity towards the aromatase enzyme compared to compound 6.

PP10. DESIGN AND DOCKING STUDIES OF PHENOTHIAZINE CLUBBED 1,2,3-TRIAZOLES DERIVATIVES WITH HUMAN TOPOISOMERASE IIA AND AROMATASE

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ABSTRACT

Cancer is a leading cause of death worldwide and it has many causes associated with it. Heterocyclic compounds like triazoles have a variety of activities and can produce better-acting anticancer compounds. Phenothiazine is a well-known antipsychotic nucleus and can be used to enhance the anticancer effect of triazoles. We designed phenothiazine clubbed triazole compounds and tested them for their anticancer potential via in silico studies on topoisomerase II α and aromatase. Twenty compounds (a1-a20) were tested for their anticancer potential. Some of the compounds produced good binding affinities toward

topoisomerase II α and aromatase and could be considered for further exploration on anticancer activity on topoisomerase II α and aromatase.

PP11. DEVELOPMENT OF N-(BENZOTHIAZOL/THIAZOL-2-YL)BENZAMIDE DERIVATIVES AS QUORUM SENSING INHIBITORS AGAINST PSEUDOMONAS AERUGINOSA

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ABSTRACT

The effectiveness of treating bacterial infections is threatened by the emergence of bacterial resistance. The development of bacterial biofilm is one of the main causes for drugs resistance. Quorum sensing (QS) inhibition was developed as an alternate treatment for biofilm inhibition. The quorum sensing signaling pathway is the target for the QS inhibition that blocks the cell-to-cell communication. This work aims to develop novel N-(benzo[d]thiazol-2-yl)benzamide and N-(thiazol-2-yl)benzamide derivatives as quorum sensing inhibitors. N-(Benzo[d]thiazol-2-yl)benzamide and N-(thiazol-2-yl)benzamide derivatives were synthesized in good yields. Furthermore, molecular docking studies of the synthesised compounds were carried out and their binding affinity values were ranged from -11.2 to -7.6 kcal/mol. Through the use of in-silico methodology, the physicochemical characteristics of these produced compounds were examined. To know the better understanding of the stability of the protein and ligand combination, molecular dynamic simulation was also done. Salicylic acid (4.40 ± 0.10) was used as the standard for quorum sensing inhibitor, and N-(benzo[d]thiazol-2-yl)benzamide (4.67 ± 0.45) was found to have a stronger anti-QS effect than salicylic acid. Overall, study findings indicated that the N-(benzo[d]thiazol-2-yl)benzamide/N-(thiazol-2-yl)benzamide derivatives might be used for developing newer quorum sensing inhibitors.

PP12. FROM INCEPTION TO ADVANCEMENTS: THE UNFOLDING STORY OF CAR T CELL THERAPY IN CANCER IMMUNOTHERAPY

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ABSTRACT

CAR T cell therapy, a revolutionary approach in cancer immunotherapy, has emerged as a promising treatment for various malignancies. Chimeric Antigen Receptor (CAR) T cells are genetically engineered immune cells designed to target specific tumor antigens, offering a personalized and precision-driven approach to cancer treatment. This therapy involves the isolation of a patient's T cells, modification to express CARs, and subsequent infusion back into the patient, where they seek out and destroy cancer cells. CAR T cell therapy has demonstrated remarkable success in clinical trials, particularly in hematological malignancies like leukemia and lymphoma, leading to durable remissions in some cases. Despite its impressive efficacy, challenges remain, including managing adverse events and expanding its

application to solid tumors. This abstract provides an overview of CAR T cell therapy, highlighting its immense potential to revolutionize cancer treatment and emphasizing the ongoing research to optimize its safety and effectiveness.

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PP13. QUALITY ASSESSMENT OF ISOFLAVONES CONTAINING TABLETS

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ABSTRACT

In recent years, the popularity of isoflavon, lauded for their nutritional and health benefits, has soared. Among these products, soy isoflavones have gained attention for their potential roles in preventing In recent years, the popularity of isoflavone, lauded for their nutritional and health benefits, has osteoporosis, hormonally influencing cancers, and providing antioxidant benefits. However, challenges related to standardization and quality control persist in the realm of herbal medicines, including soy-based supplements. This study aimed to evaluate the quality of widely used isoflavone tablets from three different commercial brands, employing established pharmacopeia standards. Parameters assessed included post-formulation characteristics (diameter, thickness, hardness, friability, weight variation, and disintegration), qualitative analysis through thin layer chromatography (TLC), and quantification of genistein using ultra-performance liquid chromatography (UPLC). The findings confirmed that the investigated soy isoflavone tablets adhered to specified post-formulation parameters, reinforcing their reliability as dietary supplements. The genistein content determined by UPLC was found to be 1768.46 ng/g, 2024.01 ng/g and 3479.20 ng/g. The investigated soy isoflavone tablets met established quality standards, affirming their suitability as dietary supplements. The consistent presence of genistein, as verified by TLC analysis, strengthens their credibility. Additionally, quantification and UPLC method validation of genistein content offers insights into potential health advantages, aiding consumers and healthcare practitioners in making informed choices.

PP14. SYNTHESIS AND PHARMACOLOGICAL EVALUATION OF 1,4-DIHYDROPYRIDINES AS NEUROPROTECTIVE AGENTS

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ABSTRACT

1,4-Dihydropyridine (1,4-DHP) has played an important role in medicinal as well as bioorganic chemistry. 1,4-Dihydropyridines possess numerous pharmacological activities such as antihypertensive, anti-cancer, anti-inflammatory, anti-tubercular, antithrombotic, vasodilatory, anticonvulsant, etc. Several literature reports highlight the significance of 1,4-

dihydropyridine (DHP) nucleus as a core template for studying the structure-activity relationships (SAR) at adenosine receptor subtypes. Research findings of structure–activity studies indicate the significance of introducing bulky groups at 4-, 5- and 6- positions for increasing the affinity and selectivity of DHPs for adenosine A3 receptor over L type calcium channel blocking effects. In the present study, a novel series of dihydropyridine derivatives with bulky 4-substituted phenyl group along with 3,5-diisopropyl dicarboxylate ester substitution is synthesized by using the Hantzsch reaction. In one series, a mixture of substituted aldehyde and isopropyl acetoacetate was heated under reflux for 6 h in the presence of isopropanol and ammonia solution. In another synthetic approach, a solution of ethyl-3-aminocrotonate, ethyl-benzoyl acetate, and substituted aldehyde was refluxed for 20 h in isopropanol to obtain the target compounds. The synthesized compounds were thoroughly characterized using IR, NMR, MS spectroscopic techniques. The newly synthesized 1,4-dihydropyridine analogues were found effective against PPZ-induced Parkinson's and LPS-induced Alzheimer's diseases when evaluated for their neuroprotective effects. The compound substituted with cyanophenyl moiety at the 4-position of 1,4-dihydropyridines nucleus displayed maximum activity in their respective series. Further 4-cyanophenyl-6-phenyl substituted DHP was found to be the most potent compound indicating the significances of this chemical moiety for A3 adenosine receptor.

PP15. NEUROMODULATION DEVICES FOR CHRONIC PAIN MANAGEMENT: ADVANCES AND APPLICATIONS

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ABSTRACT

Chronic pain is a persistent and long-lasting discomfort that lasts for weeks, months, or even years. Unlike acute pain, which is typically a temporary response to injury or illness, chronic pain often persists beyond the initial cause and can affect a person's daily life and well-being. It can result from various underlying conditions and may require ongoing medical management. Drug-based treatment of chronic pain typically involves medications aimed at alleviating pain. The choice of medication depends on the type and severity of pain, the underlying cause, and the individual's overall health. NSAIDS, opioids, muscle relaxants, topical analgesics, etc are various classes involved. However, it has certain limitations like tolerance, side effects, risk of misuse, and temporary relief. It may not address the root cause, lead to dependence, or mask underlying issues. A drug-free approach to chronic pain management offers safer, holistic relief by addressing root causes, reducing medication reliance, improving functionality, enhancing mental well-being, and potentially saving costs. Neuromodulation devices for chronic pain hold tremendous revolutionary potential in the field of pain management. It offers- 1. Increased adoption 2. Reduced medication dependency 3. Targeted pain relief 4. Minimized side effects 5. Improved quality of life 6. Customized treatment. The growth of neuromodulation devices represents a significant shift in pain management strategies, offering hope and improved outcomes for individuals living with chronic pain while reducing the reliance on medications with potential drawbacks. This field

continues to evolve, with the potential for even greater revolutionary advancements in the coming years.

PP16. BIOSENSORS FOR DIAGNOSING AND MONITORING DEPRESSION

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ABSTRACT

In accordance with the theme of CHASCON 2023 - 'GLOBAL SCIENCE FOR GLOBAL WELLBEING' the topic of our poster presentation is 'Biosensors for diagnosing and monitoring depression'. Depressive disorder (or depression) is a common mental disorder. It commonly involves a depressed mood or loss of pleasure in activities that we earlier used to enjoy. Depression can affect all aspects of both personal and professional life. According to WHO, an estimated 3.8% of the population suffers from depression. Suicide is the fourth leading cause of death in 15–29 year-olds. Even though effective treatments are available 75 % of the population of low- and middle-income countries receive no treatment. Barriers to treatment include stigma, limited access to specialty care, poor symptom monitoring, and limited patient insight into symptoms. Owing to the heterogeneity in clinical presentation and lack of potential biomarkers, diagnosis and treatment remains a challenge. Identification of relevant biomarkers would allow for improved disease classification and with more specific and successful treatment strategies. The aim of this poster presentation is to explore the current trends and ongoing research in the field of diagnosis of depression using state of the art biosensor technology.

PP17. ORGAN ON A CHIP: NEW SET UP FOR HUMAN STUDIES

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ABSTRACT

The organ-on-a-chip (OoC) models are microfluidic devices that mimic structure and function of specific human organs and tissues in-vitro. OOCs are made up of biomaterials and contain tiny channels designed to control microenvironments for growth of living cells. OoC offer great potential to revolutionize drug development, disease modelling and toxicity testing. Organ on a chip has numerous potential applications and this could lead to development of more effective and personalized treatments for several diseases. . Research over the last decade has led to the development of liver-on-a-chip models which are being used to study the initiation and progression of non-alcoholic fatty liver disease (NAFLD). Non-alcoholic fatty liver disease (NAFLD) is one of the fastest growing chronic liver diseases worldwide. Because of the complex pathophysiology, the mechanism of the disease is unknown due to which there has been an urgent need to identify new treatments for NAFLD. The poster provides an insight on how a gut-liver-on-a-chip (GLA) model has been developed by co-culturing human gut and liver cell lines. The exploration of Organ on a chip technology in NAFLD could pave the way for a better understanding of disease, drug development, toxicity testing.

PP18. "DEVELOPMENT AND VALIDATION OF STABILITY-INDICATING ANALYTICAL METHOD OF IVACAFTOR BY HYPHENATED UPLC AND DERIVATIVE SPECTROPHOTOMETRY TECHNIQUE"

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ABSTRACT

Validation plays a significant role as it provides documentary evidence for checking and verifying the validity of a process. Ivacaftor was subjected to various stress conditions as per ICH guidelines, including hydrolytic, oxidative, photolytic, and thermal stress. The significant degradation was observed only under alkaline hydrolytic conditions. Four degradation products (I- IV) were identified, each effectively resolved from the drug peak in the HPLC-UV/PDA chromatogram. The analytical methods was developed and validated as per the ICH guideline Q2(R1) parameters including linearity, precision, accuracy, specificity and robustness. This comprehensive research not only establishes reliable analytical methods for assessing Ivacaftor stability but also sheds light on Derivative Spectrophotometric Methods development for determination of an appropriate peak amplitudes in the derivative curves can impart greater specificity to a method thus permitting drug analysis in the presence of degradation products and other impurities significantly to ensuring the quality and safety of Ivacaftor. A comparative study of UV and UPLC was considered and the method was developed.

PP19. BE-FAST USER-AI INTERFACE FOR EARLY STROKE DETECTION

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ABSTRACT

Acute ischemic stroke is the second leading cause of death in elderly patients globally, having co-morbidities and a history of other lifestyle diseases including hypertension, diabetes, and cardiovascular complications. It is a medical emergency caused by a reduction in blood flow to the brain, which causes brain cell destruction. Invariably, 5-10% prevalence of stroke is found in younger adults, and 77.9% in the elderly population, of which the average annual mortality rate is 41%. The biggest challenge in stroke prevention is its early detection due to the lack of specific biochemical testing and physical parameter testing to predict the onset at the patient's end. The disease symptoms can be found as early as 24 hours before the occurrence of stroke, analyzed through BE-FAST (Balance, Eyes, Face, Arms, Speech, and Time). In this presentation, the integration of AI-based software, trained with datasets of patients for the above parameters, is suggested, into an application available as a point-of-care device at the patient's disposal. The poster will further discuss the details of the AI-based application, its usage in the early detection of stroke, its role in meeting unmet medical needs, limitations, along with the future directions for stroke prevention.

PP20. BIOELECTRONIC MEDICINE - NEXT GENERATION THERAPEUTICS

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ABSTRACT

Bioelectronic medicine represents a transformative frontier in healthcare, merging biology and electronics to develop cutting-edge therapeutic approaches. Traditional medicine has predominantly relied on pharmaceuticals and surgical interventions to treat diseases and alleviate symptoms. Bioelectronic medicine, however, harnesses the power of miniaturized electronics to interface directly with the body's neural circuits and molecular pathways. It employs devices such as neuromodulation implants and bioelectric sensors to precisely control and monitor physiological processes at the cellular level.The core concept behind bioelectronic medicine is the modulation of neural signals to restore or enhance the body's natural regulatory mechanisms. This approach has shown remarkable success in managing chronic conditions like Parkinson's disease, epilepsy, and chronic pain, offering patients improved symptom management and quality of life. Furthermore, bioelectronic medicine has the potential to revolutionize the treatment landscape by providing personalized, adaptable therapies. These therapies can respond to real-time changes in a patient's condition, optimizing treatment effectiveness and minimizing side effects. Looking ahead, bioelectronic medicine holds promise in addressing a wide range of disorders, including autoimmune diseases, diabetes, and even mental health conditions. As research and innovation continue to drive this field, we can anticipate the emergence of increasingly sophisticated bioelectronic devices and a paradigm shift towards individualized, highly effective, and minimally invasive therapies. Bioelectronic medicine is poised to redefine the future of healthcare, offering hope to millions of patients around the world.

PP21. NUTRACEUTICALS: AN EMERGING TREND

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ABSTRACT

Nutraceuticals are food with health benefits, including the prevention and treatment of diseases while all foods provide nutrients, nutraceuticals contains health promoting ingredients or natural components that have a potential health benefit for the body. Nutraceuticals are divided into three classes a) Functional foods b) Functional beverages and c) Mineral supplements. Out of all these functional foods have maximum use. They have been used in prevention and treatment of various diseases like cardiovascular, cancer, diabetes, cataract, arthritis, obesity, osteoporosis and neural tube defects etc. Today nutraceuticals consist of both traditional foods and non traditional foods. Traditional foods consists of simple natural, whole foods with new information about their potential health qualities. Non traditional nutraceuticals are foods resulting from agricultural breeding or added nutrients. Examples include carotenoids present in carrots and PUFA in vegetable oils; these are based on the belief that foods can be used as

medicine if they are properly prepared. Recently, the domestic market for nutraceuticals is approximately Rs 4,900 crore. The demand of nutraceuticals is increasing due to changing life style and increasing awareness about nutraceutical supplements. Now days, the emerging nutraceutical industries are also regulated by FDA.

PP22. VIRTUAL REALITY IN PYSCHIATRY.

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ABSTRACT

Virtual Reality (VR) has emerged as a versatile tool in healthcare, particularly in the domains of counseling and therapy. Its applications span various aspects of mental health and addiction treatment. VR is employed to create immersive scenarios that simulate real-life situations, facilitating therapeutic interventions and enhancing patient outcomes. One prominent application is in addiction treatment, where VR replicates environments conducive to addictive behaviors. Counselors can closely observe patients' reactions within these simulated settings, providing valuable insights for tailored therapy plans. This approach has proven effective in addressing a wide range of addictions, from substance abuse to behavioral dependencies. Additionally, VR plays a pivotal role in the treatment of phobias and anxiety disorders. It offers a controlled and safe platform for exposure therapy, enabling patients to confront their fears gradually. Conditions such as acrophobia, arachnophobia, panic disorder, and social phobia can be effectively managed through VR-based interventions. Moreover, VR therapy extends its reach to eating disorders, where it challenges body image disturbances and binge eating behaviors. By immersing patients in scenarios that provoke their body image perceptions and relationships with food, VR aids in treating conditions like anorexia and bulimia. In essence, VR's integration into counseling and cognitive behavior therapy has revolutionized the treatment landscape for addiction, phobias, anxiety disorders, and eating disorders. Its ability to create immersive, controlled environments empowers therapists to deliver highly personalized and effective interventions, ultimately improving the well-being of their patients.

PP23. PHYTOCHEMICAL AND ANTIDEPRESSANTS ACTIVITY EVALUATION OF TRILLIUM GOVANIANUM

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ABSTRACT

Trillium govanianum, a member of the Trilliaceae family, is traditionally recognized by its vernacular name, nag chatri. Rhizomes of T. govanianum have been used in the traditional system of medicine in subcontinent for different ailments. Dried rhizomes of T. govanianum were subjected to extraction with 80% ethanol using the reflux method, a technique ensuring optimal solute recovery. Post-extraction, a sequential fractionation was performed using solvents of varying polarities: hexane, chloroform, ethyl acetate, and butanol. The

antidepressant activity was evaluated employing the Porsolt's despair swim test. During this test, periods of immobility in mice were recorded, with a decrease in immobility time indicating potential antidepressant efficacy. Experimental groups were administered ethanol extract dosages (100mg/kg, 200mg/kg, and 400mg/kg), against a control and imipramine a standard. Remarkably, at a dosage of 400mg/kg, the extract exhibited pronounced antidepressant activity, rivaling the efficacy of the standard imipramine. The ethyl acetate fraction showed maximum activity. The diosgenin content in the herb was determined using UPLC and was found to be 0.79 % w/w. Further research is warranted to understand its mechanism of action and potential integration into modern medicine.

PP24. DEVELOPMENT AND EVALUATION OF HUMAN AMNIOTIC MEMBRANE EXTRACT(hAME) LOADED NANOPARTICULATE SYSTEM

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ABSTRACT

hAME is being extensively researched for its applications in chemical ocular burns (promotes epithelialization and decreases pain, haze and inflammation), wound healing (promotes epidermal and dermal regeneration and improves the orientation of dermal collagen bundles), dry eye (reduction in corneal inflammation and protection of corneal epithelial cells), and corneal surface injuries. However, the delivery of peptide therapeutics to the site of action is a big challenge considering their high proneness to enzymatic degradation, hydrophilicity, large molecular weight, limited transfer across cell membranes due to high hydrophilicity, activation of immunological responses, and short half – lives. In this regard, vesicular systems have gained high recognition, particularly as carriers for delivering bio-actives with improved bioavailability and storage stability, and controlled release. hAME was incorporated into nanovesicles (NVs) using patented technique of our lab (Patent No. 341360). Organic phase comprise ethanol with suitable quantity of a surfactant at 55oC and containing a low molecular weight water soluble polymer and the hAME. Organic phase was incorporated into the aqueous phase at same temperature to form nanovesicles. The hAME nanovesicles were analysed by FE-SEM and optical microscopy confirming their small size, round, unilamellar structure with no irregularities. hAME-NVs showed a particle size of 226.3± 17.2 nm (n=4) and a PDI of 0.056. A PDI of <0.2 indicates significantly narrow particle size distribution. The total drug content (TDC) of the hAME-NVs was 93.35±2.63% w/v and entrapment efficiency was 75.225 ± 2.87% (n=4). These nanovesicles were then formulated into nanofibers which can have extended applications.

PP25. PREPARATION AND QUANTITATIVE ANALYSIS OF SOLID LIPID NANOPARTICLES (SLNS) OF DEXAMETHASONE BY FT-NIR SPECTROSCOPY

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ABSTRACT

Dexamethasone, a corticosteroid that is similar to a natural hormone which is produced by adrenal gland, is used for treating arthritis, blood/hormone/immune system disorders and allergic reactions. Nowadays, solid lipid nanoparticles (SLNs) are being used as a carrier system for the delivery of dexamethasone within the body. In this present study, we have prepared and used a novel method for characterization of SLNs of dexamethasone using FT-NIR. The FT-NIR methods are useful in analysis as these are non-destructive, fast and accurate. The characterization of SLNs of dexamethasone was also done using particle size analyzer, DSC, FT-IR, HRTEM, and UV-Spectrophotometer. Discriminant analysis and PCA (Principal Component Analysis) were the chemometric methods that were used for qualitative analysis of dexamethasone loaded SLNs. A different chemometric method was also developed for qualitative and quantitative estimation of marketed formulation of dexamethasone (DEXAMTM). All the results for quantitative and qualitative analysis were precise and accurate. Calibration of the models was performed on full spectral region (10,000-4,000 cm-1) for these methods. Analysis results for the DEXAMTM tablet by CLS and PLS regression methods were found to be most accurate indicating high percentage purity i. e. 100.6% and 99.7%, respectively. Key words: Dexamethasone, SLNs, FT-NIR

PP26. CONVENTIONAL AND MODERN TREATMENTS OF PARKINSON'S DISEASE

Prabal[1], Richa Sharma[1]

[1]*Authors*

ABSTRACT

Parkinson's disease (PD) is a neurodegenerative disease manifesting with motor and non motor symptoms. Degeneration of nigrostriatal dopaminergic neurons is a common pathological find in parkinson's disease (PD).Current treatment mainly relies on medication as a symptomatic therapy. Levodopa is the gold standard for PD.However, emergence of motor complications such as wearing off phenomenon, is a common clinical problem. Disease modifying therapy that affects the underlying fundamental pathophysiology of disease are under progress.If someone has very distressing symptoms despite taking medications , a treatment known as deep brain stimulation might be considered.Through this poster we want to discuss the key aspects of parkinson's disease including its etiology ,symptoms ,treatments and diagnosis options. We also delve into ongoing research efforts and promising breakthroughs in the quest for cure. By raising awareness we hope to inspire optimism and support for those living with parkinson's disease.

PP27. IDENTIFICATION AND CHARACTERIZATION OF STRESS DEGRADATION PRODUCTS OF IVACAFTER BY HYPHENATED LC-MS TECHNIQUE

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ABSTRACT

Stability of drug molecule is a very critical parameter as change in its property can be a concerning risk to the patient or formation of a toxic degradation product can hinder its purity, safety and potency and deliver a lower dose than anticipated. Stress testing can help identify the likely degradation products which helps in finding degradation pathways and validate the stability indicating procedure. Ivacaftor was subjected to forced degradation conditions of hydrolysis (neutral, acidic, alkaline), oxidation, photolysis and thermal stress as suggested in ICH guideline Q1A(R2). The drug showed significant degradation under hydrolytic condition. In total, four degradation products (I-IV) were formed, all degradation products were formed in alkaline hydrolysis. The drug remained stable to acidic and neutral hydrolytic conditions and even to basic/neutral and acidic photolytic conditions. No degradation was seen when subjected to oxidative as well as thermal stress. The degradant products were separated using hyphenated UPLC-PDA chromatographic technique, using degraded solution. The column used was Phenomenex C-18 (100 mm x 4.6 mm; 2.6 µ, Kinetex®). Detection wavelength was selected as 310 nm. The studies were later extended to MS/TOF studies were conducted on the drug and stress degraded samples which integrated to elucidate the chemical structure of the four degradation products (I, II, III, and IV) and the mass spectral data was interpreted which helped in characterization of the products .

PP28. EXPLORING THE POTENTIAL OF ELECTRONIC PILLS: A PARADIGM SHIFT IN HEALTHCARE MONITORING AND TREATMENT

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ABSTRACT

The emergence of electronic pill technology has the potential to revolutionize healthcare by providing improved and accessible medical treatments. This technology utilizes components such as drug reservoirs, delivery pumps, microcontrollers, wireless communication, and sensors, all combined into a small pill-shaped capsule that can be swallowed. Once ingested, the electronic pill travels through the gastrointestinal tract, collecting valuable data using multichannel sensors and tiny cameras. It measures pH, temperature, and other vital parameters, as well as captures images of the oesophagus and intestines. This information is then transmitted to a doctor's computer for analysis. The electronic pill offers non-invasive monitoring, eliminating the need for invasive procedures like endoscopies or catheters. Additionally, it enables precise and adaptable drug delivery patterns. As research and development continue, electronic pills hold promise for personalised disease treatments and targeted drug delivery in the future, transforming the healthcare industry.

PP29. BIOELECTRONIC MEDICINE – NEXT GENERATION THERAPEUTICS

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ABSTRACT

Bioelectronic medicine represents a transformative frontier in healthcare, merging biology and electronics to develop cutting-edge therapeutic approaches. Traditional medicine has predominantly relied on pharmaceuticals and surgical interventions to treat diseases and alleviate symptoms. Bioelectronic medicine, however, harnesses the power of miniaturized electronics to interface directly with the body's neural circuits and molecular pathways. It employs devices such as neuromodulation implants and bioelectric sensors to precisely control and monitor physiological processes at the cellular level. The core concept behind bioelectronic medicine is the modulation of neural signals to restore or enhance the body's natural regulatory mechanisms. This approach has shown remarkable success in managing chronic conditions like Parkinson's disease, epilepsy, and chronic pain, offering patients improved symptom management and quality of life. Furthermore, bioelectronic medicine has the potential to revolutionize the treatment landscape by providing personalized, adaptable therapies. These therapies can respond to real-time changes in a patient's condition, optimizing treatment effectiveness and minimizing side effects. Looking ahead, bioelectronic medicine holds promise in addressing a wide range of disorders, including autoimmune diseases, diabetes, and even mental health conditions. As research and innovation continue to drive this field, we can anticipate the emergence of increasingly sophisticated bioelectronic devices and a paradigm shift towards individualized, highly effective, and minimally invasive therapies. Bioelectronic medicine is poised to redefine the future of healthcare, offering hope to millions of patients around the world.

PP30. DESIGN, SYNTHESIS AND EVALUATION OF COMBINED ANTI-DOPAMINERGIC AND ANTI-SEROTONERGIC ACTIVITIES OF ARYL SUBSTITUTED IMIDAZOLE DERIVATIVES AS ATYPICAL ANTIPSYCHOTICS

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ABSTRACT

In an attempt to prepare a series of novel atypical antipsychotic molecules, we have designed and synthesized imidazole-based compounds as a part of this research work. The authenticity and purity of the compounds was ascertained through various spectral techniques including Infrared Spectroscopy, Nuclear Magnetic Resonance Spectroscopy, Mass Spectroscopy and chromatographic techniques. *In-silico* docking studies were carried out as part of drug design, for test compounds which showed binding for D2 and 5HT2A receptors. The logBB values for the test compounds AAK-1 to AAK-7 were found to range from -0.810 to 0.576, which depicted a good BBB (blood brain barrier) penetration. The pharmacological testing for

atypical antipsychotic activity was carried out on Albino LACA mice in apomorphine induced mesh climbing and stereotypy assays (indicative of anti- dopaminergic activity) and DOI induced head twitches assay (indicative of anti-serotonergic activity). Clozapine was taken as the standard drug. The results have shown potential atypical antipsychotic profile for compounds AAK-1, AAK-2, AAK-3, AAK-4, AAK-5, AAK-6 and AAK-7. All the compounds showed atypical antipsychotic profile at all employed doses. All the test compounds were found to display better potency than clozapine in anti-dopaminergic assays. The test results were compared with the control group and statistical analysis carried out using one way ANOVA followed by TUKEY test ($p<0.05$). These assays showed an atypical profile for the compounds AAK-1 to AAK-7 (ED50 values 1.29, 1.54, 1.60, 1.64, 1.29, 1.56, 1.48 mg/kg). These evaluations mark our compounds as promising leads, for the development of potential atypical antipsychotic molecules.

PP31. PHYTOCHEMICAL STUDIES AND EVALUATION OF MEMORY ENHANCING ACTIVITY OF CUSCUTA REFLEXA AND CASSYTHIA FILIFORMIS L.

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ABSTRACT

Cuscuta reflexa and *Cassytha filiformis* are a parasitic angiosperms that are being used inter-changeably due to their morphological similarities. These plants have been traditionally used as a diuretic, antidepressant, anti-gout, anti-rheumatic, and neuroprotective agents. In the present study, a comparative TLC and phytochemical profiles of *Cuscuta reflexa* and cassytha filliformis were developed. *Cuscuta reflexa* and Cassytha filliformis 50% aqueous methanol extracts were also evaluated for their effect on memory against scopolamine induced memory impairment at two oral dose levels of 200 and 400 mg/kg. The effect on memory was evaluated using elevated plus maze and Morris water maze behavioural paradigms. The results showed that *C. reflexa* at 400 mg/kg showed better activity in comparison to that of *C. filliformis*. *C. reflexa* (400 mg/kg) significantly ameliorate the scopolamine induced memory impairment which was indicated by low transfer and escape latencies in both the behavioural paradigms, respectively.

PP32. DESIGN, SYNTHESIS AND EVALUATION OF OXAZOLE BASED POTENTIAL CYCLOOXYGENASE INHIBITORS WITH ANTIOXIDANT ACTIVITY

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ABSTRACT

In an attempt to prepare a series of novel cyclooxygenase inhibitor molecules, we have designed Aryl substituted oxazole---based compounds as a part of this research work. The authenticity and purity of the compounds was ascertained through various spectral techniques and In-silico docking studies were carried out as part of drug design, for test compounds ASS-

1 to ASS-8 ,which showed binding for COX2 receptors. Docking results were seen with the scores was found ranging from -7.9 to -10.6. Further QSAR studies on previously synthesized compounds in our laboratory suggested potential for anti-inflammatory activity in the proposed compounds. The results from the QSAR studies and docking studies have generated useful information that will help in strategic design of novel cyclooxygenase-2 inhibitors with potential antioxidant activity.

PP33. SYSTEMATIC DEVELOPMENT AND VALIDATION OF ANALYTICAL AND BIOANALYTICAL UPLC METHOD FOR SIMULTANEOUS ESTIMATION OF DOCETAXEL (DTX) AND CURCUMIN (CMN) USING ANALYTICAL QUALITY BY DESIGN (AQBD) APPROACH.

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ABSTRACT

Docetaxel (dtx) and curcumin(cmn) are chemotherapy drugs used to treat several types of cancer. DTX, a crucial chemotherapeutic agent, is hampered by development of resistance on use this. To address these limitations, we have employed curcumin as a P-glycoprotein inhibitor alongside DTX, necessitating the development of an efficient analytical method for their simultaneous estimation using UPLC. We applied analytical quality by design (AQbD) principles using Taguchi design to screen the critical parameters affecting the response. Thus, a rapid UPLC method was developed and validated as per ICH guideline. The developed UPLC method utilizes a C18 column with isocratic elution (acetonitrile: water, 1:1, pH 3 with 0.1% acetic acid) at a flow rate of 0.10 mL/min for analytical purposes. Detection is achieved at 230 nm and 425 nm for DTX and curcumin, respectively. Linearity was observed over a range of 200-1600 ng/mL for DTX and 20-160 ng/mL for curcumin (correlation coefficient = 0.99). For bioanalytical purposes, a slight modification was made by adjusting the elution flow rate to 0.08 mL/min to fine-tune the retention time (RT) of curcumin in the presence of DTX, and successful validation studies for precision and recovery were conducted. Furthermore, we successfully implemented this method for the analysis of DTX and curcumin in solid lipid nanoparticles (SLN) formulation employed to improve solubility and bioavailability of both the agent. This method proves valuable for quantifying DTX and curcumin in SLNs and holds promise for various applications in pharmaceutical research.

PP34. DARUHARIDRA NANO-FORMULATION: ELEVATING THERAPEUTIC POTENTIAL AND MEMORY ENHANCEMENT

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ABSTRACT

This study endeavors to advance the clinical significance of Daruharidra, an esteemed traditional Indian medicine, with a specific emphasis on its potential as a memory-enhancing agent. Daruharidra's historical significance is hindered in modern clinical use due to low oral bioavailability and high recommended dosages. To address these restraints, we developed a sophisticated nano-colloidal system enriched with Daruharidra extract. The study began with the preparation of an optimized plant extract with an enhanced solubility profile. Subsequently, nano-formulation was meticulously crafted via the heat and pressure homogenization technique. The nano Phyto formulation showcased precise attributes, including optimal nanoscale particle size, elevated drug content, and superior entrapment efficiency. The developed nano-system, with its augmented drug loading, solubility, stability, and bioavailability, has the potential to substantially reduce required dosages, subsequently amplifying the safety profile of Daruharidra. The in vitro studies bore testament to sustained drug release, while rigorous analytical scrutiny affirmed the stability of the system. The efficacy of nano-formulation was evaluated within a scopolamine-induced memory impairment model in mice, where it exhibited superior performance in comparison to the standard drug, Donepezil. In summation, our systematic exploration boosts Daruharidra's therapeutic potential. The successful formulation enhances bioavailability and reduces dosage, representing a significant step towards Daruharidra-based treatments for individuals with memory-related challenges, highlighting its transformative potential.

PP35. PERSONALISED MEDICINE AND PHARMACOGENOMICS: A PROMISING APPROACH TO COMBAT ANTIMICROBIAL RESISTANCE

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ABSTRACT

Antimicrobial resistance (AMR) is a growing global concern that threatens the effectiveness of antibiotics. Personalised medicine and pharmacogenomics are emerging approaches that can help combat AMR by promoting precise and individualised medicine. Pharmacogenetics and pharmacogenomics deal with genetically determined variants in how individuals respond to drugs, and hold the promise to revolutionise drug therapy by tailoring it according to individual genotypes. Personalised medicine recognises that no two patients are alike and aims to use an individual's genetic profile to make the best therapeutic choice by facilitating predictions about whether that patient will respond to a particular drug.Personalised Medicine and Pharmacogenomics emerge as a promising strategy to address AMR. These fields enable the tailoring of antibiotic treatments based on individual genetic profiles, optimising

therapeutic outcomes. Specific genetic variations impacting antibiotic metabolism and efficacy are examined, offering a glimpse into the precision medicine revolution.The integration of pharmacogenomics into the fight against AMR is pivotal for preserving the effectiveness of antimicrobial agents. This abstract underscores the significance of personalised medicine in addressing a pressing global health issue, fostering hope for a world where antibiotics remain a potent tool in our fight against infectious diseases.

PP36. MICROFLUIDIC DEVICES

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ABSTRACT

Microfluidics, a cutting-edge interdisciplinary field, has emerged as a transformative technology with profound implications across various domains. It involves the manipulation of tiny volumes of fluids, typically at the microlitre or nanolitre scale within microscale devices known as Microfluidic devices. In the pharma industry, these devices are used for various applications such as drug discovery, drug delivery, and diagnostics. They offer precise control over fluid flow, enabling efficient testing, analysis, and production processes. Recent advancements in microfluidics include the integration of multiple functions within a single device, the development of novel materials, and the miniaturization of analytical instruments. These innovations open new avenues for personalized medicine, environmental monitoring, and the exploration of complex biological systems. In conclusion, microfluidics stands at the forefront of scientific and technological progress. Its ability to manipulate fluids on a miniature scale has already transformed diverse fields and promises continued innovation. As researchers and engineers harness the full potential of microfluidics, we can anticipate even more groundbreaking applications that will shape the future of precision science and technology.

PP37. NOVEL SOLID LIPID NANOPARTICLES FOR ENHANCED BREAST CANCER TREATMENT THROUGH TARGETED CO-ENCAPSULATION OF DOCETAXEL AND CURCUMIN

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ABSTRACT

This research aims to enhance breast cancer treatment through innovative drug delivery using solid lipid nanoparticles (SLNs). Docetaxel (DTX) treatment often leads to cancer cell resistance due to multidrug resistance (MDR) proteins and anti-apoptotic mechanisms. Co-encapsulating DTX with Curcumin (Cmn), a P-glycoprotein efflux modulator within SLNs will address drug resistance, and concentration-dependent side effects of DTX improving solubility and bioavailability of both the components. Solid lipid nanoparticles (SLNs) were prepared via high-pressure hot homogenization, optimizing Compritol® 888 ATO and Tween 80 concentrations using Box Behnken Design. The resulting SLNs had a size (218.1 ± 42.8 nm; PDI <0.4), zeta potential (-18.09 mV), and were characterized through techniques

including HRTEM, FESEM, DSC, FTIR, and XRD. The total content of DTX and Cmn in the SLNs was >80% respectively, of the initially used amounts (DTX 10.00 mg and Cmn 1.00 mg). The encapsulation efficiencies were 84.14% for DTX and 78.25% for Cmn. Drug release studies unveiled a zero-order release pattern extending for 48 hrs establishing controlled release. Different drug formulations including free DTX, DTX SLNs, DTX-Cmn SLNs, were tested on three cancer cell lines (MCF-7c, MDA-MB-231a, T-47 Db). DTX-Cmn SLNs showed significantly higher cytotoxicity (800% increase in killing). In conclusion, our innovative SLN formulation presents an encouraging strategy for enhancing breast cancer treatment by precisely co-encapsulating DTX and Cmn, thereby advancing drug delivery and therapeutic efficacy.

PP38. OPTIMIZATION AND EVALUATION OF TRADITIONAL NSAIDS FOR GASTROPROTECTION

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ABSTRACT

Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) are commonly used to alleviate pain and reduce inflammation by inhibiting COX-1&2 responsible for producing prostaglandins. Conventional non selective NSAIDS with a range of concerning side effects i.e. the increased risk of gastric ulcers and gastrointestinal bleeding, are of particular problem especially for long-term users. Present study aimed to synthesize selective COX-2 inhibitors targeting COX-2 while sparing COX-1 which is responsible for prostaglandin production. Modification of the traditional NSAID Ibuprofen was carried out and successfully led to the creation of selective COX-2 inhibitors, with desired specificity by altering Ibuprofen's structure to fit the COX-2 active site while avoiding COX-1 interaction.Novel ten (10) amide derivatives of ibuprofen have been synthesized, characterised and studied for analgesic and anti-inflammatory activity using acetic acid induced writhing assay and paw edema models in rats respectively. In particular derivative N-(4-(1-(hydroxyiminoethyl)phenyl)-2-(isobutyl-phenyl)-propionamide(7) depicted better efficacy with increased number of writhings 82.38±0.89 and reduced paw edema volume 16.81±0.83 than Ibuprofen. Antiulcer activity was also carried out as one of the key toxicological studies and indicated the gastroprotective nature of 7 with least formation of ulcers and ulcer index:0.38±0.16 amongst all the derivatives synthesized. Additionally docking study was carried out using autodock to find out the binding interactions & binding orientation of these novel derivatives of ibuprofen into their binding site of COX enzyme (PDB ID 5F1A).

PP39. WOUND HEALING- A LATENT GLOBAL BURDEN

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ABSTRACT

Any cellular or structural disruption of skin is considered as a wound. Wounds have emerged as a major global health burden by affecting 0.2% of the worldwide population. The global

wound care market reached around 12 billion US dollars in 2020 and is expected to touch 18.7 billion US dollars by 2027. Wounds affect the well being and quality of life of the individual to varying degrees depending on the wound's severity, type (acute or chronic wounds), cause (burns, injury, surgery, trauma) and if the individual is going through any existing chronic complications or any severe infections. Acceleration of the process of wound healing effectively by overcoming the limitations of the current therapies is a major research area globally. Wound healing is a cascade of overlapping phases of homeostasis, inflammation, cell proliferation & migration and remodeling. By understanding these processes, their pathophysiology, we plan to focus on the potential targets which can facilitate effective wound healing through this compilation.

PP40. THERAPEUTIC POTENTIAL OF ALLIUM SATIVUM AGAINST THE AB (1-40)-INDUCED OXIDATIVE STRESS AND MITOCHONDRIAL DYSFUNCTION IN THE WISTAR RATS

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ABSTRACT

Background: Mitochondrial functionality has been reported to be lethally compromised in early stages of any neurodegenerative-disease. Though the exact flow of the events is still unclear, it is likely to represent a progressive neuron and cognitive-function decline. Herbal extracts restoring the mitochondrial functionality may be a treatment approach to chronic neurodegenerative disorder like Alzheimer's disease (AD). Objective: To evaluate the activity of *Allium sativum* (AS) supplementation against Aβ1-40 induced oxidative stress and mitochondrial dysfunction. Materials & methods: AD was induced by a single intra-hippocampal injection of Aβ1-40 (5 µg/4 µl). Herbal supplementation (100, 250, 500 mg/kg body weight, daily) was given orally for 3 weeks. Cognitive function assessed by Morris water maze signified deficits in Aβ1-40 treated animals. Insignificant alteration in locomotor function was examined by actophotometer. The results were accompanied by enhancement in oxidative stress by measuring accentuated ROS and protein carbonyl levels. Results: ⎫ A significant decrease in antioxidant enzymes was reported for the Aβ1-40 treated animals. This was expressed by o reduced superoxide-dismutase and catalase activity o reduction in GSH levels o impaired mitochondrial functions. ⎫ Medium dose of AS was found to be effective in restoring the memory impairment and antioxidant levels. But in Aβ1-40 treated group high dose of AS was reported more efficient. ⎫ High dose of AS significantly ameliorates the mitochondrial-dysfunction in comparison to its medium dose. Conclusion: The findings reveal that AS reverses Aβ1-40 induced brain alteration, hence could be an efficient therapeutic consideration action against AD growth.

PP41. DEVELOPMENT OF N-(2- AND 3-PYRIDINYL)BENZAMIDE DERIVATIVES AS QUORUM SENSING INHIBITORS AGAINST PSEUDOMONAS AERUGINOSA

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ABSTRACT

The development of bacterial resistance to chemical therapy poses a severe danger to the efficacy of treating bacterial infections. One of the key factors for resistance to antimicrobial medications is the growth of bacteria in biofilm. Quorum sensing (QS) inhibition was created as an alternative therapy by developing novel anti-biofilm medicines. QS inhibition targets the QS signalling system by impeding cell-cell communication. In order to combat Pseudomonas aeruginosa, this study aims to create novel antimicrobial medicines that suppress QS and function as anti-biofilm agents. N-(2- and 3-pyridinyl)benzamide derivatives were chosen for design and synthesis in this investigation. All of the synthetic compounds shown antibiofilm activity, the biofilm was clearly compromised, and the OD595nm values of the solubilized biofilm cells displayed a significant Difference between treated and untreated biofilms.

PP42. EMERGING TECHNIQUES AND NEW PHARMACEUTICAL APPROACHES TO CONFRONT ANTIBIOTIC RESISTANCE

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ABSTRACT

Antibiotics are drugs that are either used to destroy (bactericidal effect) or slow down the growth of bacteria (bacteriostatic effect), thus decreasing the rate of infection. Due to their prophylactic effect, they have also been used in the cocktails of drugs to treat intricate diseases, and medical emergencies including cancer treatment, surgeries like organ transplants, and open-heart surgery. This has resulted in increased life expectancy in the last 100 years. However, misuse of such molecules has resulted in the rapid rise of antibiotic resistance, which can be acquired through mutation, and the acquisition of external genes or can be natural which is manifested by changes in antibiotic permeability, alteration of target molecules, enzymatic degradation of the antibiotics, and efflux of antimicrobials from the cytosol. This has led to issues in intensive care units, raising medical expenses and risking patients' lives. With the growth of multidrug-resistant bacteria, novel antibiotic approaches are needed. In this review, we explore antibiotic resistance and innovative strategies used in recent times to overcome the resistance, including the use of nanoparticles both lipid-based and inorganic, and polymeric-based formulations including hydrogels, nanospheres, etc. We further discuss the applications of phototherapy, combination drug therapy, the use of antimicrobial peptides, phage therapy with the most used CRISPR technology, and their impact on evading antibacterial resistance.

PP43. PURINE DERIVATIVES AS ANTI-CANCER AGENTS

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ABSTRACT

Cancer refers to complex group of diseases that can occur in any part of the body. Due to abnormal growth of cells, these cells proliferate uncontrollably and, in some cases, metastasize. Purine (Imidazo[4,5-d]pyrimidine) is fused heterocyclic compound containing imidazole and pyrimidine rings which is the most ubiquitous in nature. Purine is involved in many metabolic processes as a cofactor and associated with number of enzymes and receptors in cell signalling. Purine derivatives are used for cancer therapy. The mechanism of purine-based drugs is associated with blocking of key enzymes involved in metabolism or impaired synthesis of nucleic acids. In the current poster, we discussed a literature review on purine derivatives as anti-cancer agents.

PP44. RECENT ADVANCES OF BENZIMIDAZOLE AS AN ANTI-CANCER

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ABSTRACT

Cancer is one of the leading diseases which are characterized as uncontrolled growth of cells that can be rapid or slow depending on its type. Benzimidazole is a heterocyclic compound which is a key component in many bioactive compounds. It is an important pharmacophore in medicinal chemistry, formed from the fusion of benzene and imidazole. Benzimidazoles are very useful subunits/intermediates that are used for the development of molecules of pharmaceutical or biological interest. In this poster, we have compiled the literature review for the evaluation of recent advances of benzimidazole as an anti-cancer agent against lung cancer. The discussed derivatives showed good anticancer activity.

Physical Sciences

- Physics
- Nanoscience & Nanotechnology
- Medical Physics

CO-ORDINATORS

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CHASCON – 2023

National Conference on

Global Science for Global Wellbeing

SECTIONAL PROGRAMME (OCTOBER 13, 2023)
PHYSICAL SCIENCES
Venue: Department of Physics, Panjab University, Chandigarh

Sectional President Professor Vipin Bhatnagar 99152 81438	Sectional Secretary Dr. Sushil S. Chauhan 87003 75753

Time	Program
9:00 – 11:00	Commencement of Program – Welcome by Sectional President Oral Presentations – I (Faculty, Students and Research Scholars) **Venue:** Ground Floor Seminar Room
11:00 – 11:20	Tea Break (GF Seminar Room Corridor)
11:20 – 12:10	**Session Chair:** Professor G.S.S. Saini **Speaker:** Dr. Suvankar Chakraverty, Scientist F, INST, Mohali ***"Quantum Materials"***
12:10 – 13:00	**Guest of Honor:** Professor Navdeep Goyal **Speaker:** Dr. Arun S. Oinam, Associate Professor Department of Radiotherapy, PGIMER, Chandigarh ***"AI: Development History, How it Works and Its Application in Radiation Oncology"***
13:00 – 14:00	Lunch Break
14:00 – 15:30	Poster Presentations **Venue:** Ground Floor Corridor of Department of Physics
15:30 – 16:00	Tea Break
16:00 onwards	Oral presentations – II (Research Scholars) **Venue:** Ground Floor Corridor of Department of Zoology
	Closing Session – Vote of Thanks – Section Secretary

ABSTRACTS OF ORAL PRESENTATIONS

PARTICIPANTS

S. No.	Name of participant	Affiliating institution	Title of abstract
1.	Gulsheen Ahuja	Department of Physics, Panjab University, Chandigarh	Reconstructing the unitary representations of the CKM matrix
2.	Manish Dev Sharma	Department of Physics, Panjab University, Chandigarh	Automation technique in diagnosis by artificial intelligence for global wellbeing
3.	Richa Rastogi	Centre for Nanoscience & Nanotechnology, South Campus, Panjab University, Sector 25, Chandigarh	Nanoparticles based conductive inks: A way to flexible green electronics
4.	Kirti Hooda	Centre for Nanosciences and Nanotechnology, Panjab University, Chandigarh, India	To study the effect of varying pH, carbon and nitrogen sources on the biosurfactant production of Candida parapsilosis at laboratory scale
5.	Latika Aggarwal	University Institute of Engineering and Technology, Panjab University, Chandigarh	Measurement of the branching fraction of the excited strange charm meson decays
6.	Maitreyee Mukherjee	Panjab University Chandigarh	Prospects of mixing angle measurements in Electroweak Gauge Theory through high energy experiments
7.	Rohit	Centre for Nanoscience and Nanotechnology, Panjab University, Chandigarh	Effect of polymer on growth of metal oxide nanostructures
8.	Ruchika	Department of Physics, Panjab University, Chandigarh	Exploring non-equilibrium dynamics in $NdNiO_3$: A review of phase separation and glassy states
9.	Sajjad Hussain	Centre for Nanoscience and Nanotechnology, Panjab University, Chandigarh	Structural and optical properties of copper selenide nanoparticles
10.	Ayushi Mahajan	Department of Physics, Panjab University, Chandigarh	RFID-activated solar powered cell phone charging station

11.	Keshav	Physics Department Panjab University Chandigarh	Introducing particle physics at The Large Hadron Collider for M.Sc. students through hands-on experiments
12.	Nazam	Panjab University, Chandigarh	Emerging frontiers of cryogenic technology
13.	Shruti Rohilla	Department of Physics, Panjab University, Chandigarh, India	Solar-powered mobile phone charging station with RFID activation and solar tracking
14.	Uday Karanbir Singh	Centre for Nanoscience & Nanotechnology, South Campus, Panjab University, Chandigarh	Paper supercapacitor fabrication via inkjet-printed carbon nanotubes ink
15.	Gurnoor Kaur	Authors	Schottky diodes as sensors: A comprehensive review
16.	Neeraj Gupta	Authors	I-V characteristics of Schottky diodes: A review

OP1. RECONSTRUCTING THE UNITARY REPRESENTATIONS OF THE CKM MATRIX

Gulsheen Ahuja[1]

[1]*Department of Physics, Panjab University, Chandigarh*

ABSTRACT

Over the last few decades, Cabibbo-Kobayashi-Maskawa (CKM) phenomenology has registered remarkable progress on the phenomenological as well as experimental front. However, in spite of this, we are saddled with several issues which need to be addressed, e.g., recently, PDG has reported a 2.2 σ deviation from unitarity in the first row of the mixing matrix giving rise to two intriguing anomalies related to the element Vus or the Cabibbo mixing angle, known as the Cabibbo Angle Anomaly 1 (CAA1) and the Cabibbo Angle Anomaly 2 (CAA2). Also, for a long time there have been a persistent divergence in the inclusive and exclusive values of the CKM matrix elements Vub and Vcb. It is interesting to carry out a deeper investigation of these issues which may lead to signals beyond the Standard Model, however, before reaching at firm conclusions in this regard one needs to have a critical look at the basic features of the CKM paradigm. Interestingly, several authors have proposed different representations of the CKM matrix, however, their construction, inter-relation as well as implications in explaining different CKM phenomena have not been explored in sufficient detail. Keeping this in mind, we have made an attempt to construct all possible independent parameterizations of CKM matrix in an ab-initio manner and have explored the relationship of these with the already available representations. Further, we have also found the suitability of specific representations in explaining CKM parameters such as the CP violating parameter ϵ_K, etc.

OP2. AUTOMATION TECHNIQUE IN DIAGNOSIS BY ARTIFICIAL INTELLIGENCE FOR GLOBAL WELLBEING

Shelly Sharma[1], Manish Dev Sharma[2]

[1]*Postgraduate Institute of Medical Education and Research, Chandigarh,* [2]*Department of Physics, Panjab University, Chandigarh*

ABSTRACT

Artificial Intelligence is a very helpful tool to analyze the findings and making decision in many scientific areas of research. Similarly the AI tool has lots of contribution in the area of healthcare and medical diagnosis for human wellbeing after training of the sets. The screening of the cervical smears was automated earlier in the early fifties with a successful attempt. Automated instrumentation has the hidden potential to improve the sensitivity and to reduce the unsatisfactory specimen. In the world of AI, automation has become more and more advanced by the development of complex programs globally. Few significant developments like *CYTOANALYSER* earlier developed by Mellors and coworkers, gather data on nuclear size and nuclear optical density of cells has totally changed the era in diagnosis of samples in short interval of time. Many more developments in such a way will improve the global wellbeing of the mankind in the upcoming years.

OP3. NANOPARTICLES BASED CONDUCTIVE INKS: A WAY TO FLEXIBLE GREEN ELECTRONICS

Richa Rastogi[1], Uday Karanbir Singh[1], Pushpinder Kaur[2]

[1]Centre for Nanoscience & Nanotechnology, South Campus, Panjab University, Sector 25, Chandigarh, [2] Sri Guru Gobind Singh College, Sector 26, Chandigarh

ABSTRACT

Green or biodegradable Electronics have been considered as one of the most exciting technologies in the near future for reducing E-waste generated by the mictroelectronics components. Paper based printed electronics has paved the way for reduction of E-waste due to sustainability, low cost, mechanical flexibility, etc. However, the major hurdle in this field is the conductive inks required for printing. Nanoparticles based conductive inks are the right answer to this problem. Here, we report synthesis of carbon nanotubes and carbon nanotubes-Polyaniline composite based conductive inks for inkjet printed electronics. Conductive inks have been characterized by UV-Vis spectroscopy, FTIR, XRD etc. Ink parameters like viscosity, contact angle and conductivity are also measured to ascertain the ink quality for inkjet printed electronics. Conductive patterns were printed on A-4 size bond paper. From observed data it can be concluded that functionalized multiwalled carbon nanotubes (f-MWNT) ink was more stable and dispersive as compared to other inks though its resistance is higher. While pristine multiwalled carbon nanotubes (MWNT) ink is most conductive and most suitable for inkjet printing of conductive patterns for printed electronics. Composite inks were not found to be suitable for inkjet printing of conducting patterns, as the Aniline content was not enough for formation of conductive paths in printed patterns.

OP4. TO STUDY THE EFFECT OF VARYING PH, CARBON AND NITROGEN SOURCES ON THE BIOSURFACTANT PRODUCTION OF CANDIDA PARAPSILOSIS AT LABORATORY SCALE

Kirti Hooda[1], Mary Chatterjee[2]

[1]Centre for Nanosciences and Nanotechnology, Panjab University, Chandigarh, India, [2] Department of Biotechnology Engineering, UIET, Panjab University, Chandigarh, India

ABSTRACT

Biosurfactants are secondary metabolites produced by a wide range of microorganisms, such as bacteria, fungi, and yeast, and are either discharged extracellularly or adhered to cell surfaces. Although it is known that Candida parapsilosis may grow in the pH range of 4.0 to 8.0, it has a optimum pH at which biosurfactant production is maximum. The yield of biosurfactants, cell biomass, and growth rate can all be affected by pH changes. Finding the pH range where Candida parapsilosis flourishes and produces the maximum biosurfactant is crucial. The kind and quantity of biosurfactants generated are influenced by the carbon sources. Due to their digestion and usage, some sources, including glucose, glycerol, and vegetable oils, can encourage increased biosurfactant synthesis. The generation of microbial biomass and biosurfactants depends heavily on nitrogen. Different nitrogen sources may have an impact on nitrogen metabolism, which in turn may have an impact on the synthesis of

biosurfactants. The synthesis of biosurfactants, cell growth, and the type of biosurfactant that is generated can all be influenced by nitrogen sources. In order to get significant production of biosurfactants, organic nitrogen sources as peptones, yeast extract, or ammonium salts may be utilized. Therefore, finding out the optimum pH, carbon and nitrogen source are important process paramenters to be looked upon for maximize the production of biosurfactant from Candida parapsilosis.

OP5. MEASUREMENT OF THE BRANCHING FRACTION OF THE EXCITED STRANGE CHARM MESON DECAYS

Latika Aggarwal[1], Sunil Bansal[1], Vishal Bhardwaj[2]

[1]University Institute of Engineering and Technology, Panjab University, Chandigarh, [2] IISER Mohali

ABSTRACT

The excited strange charm meson Ds*+ decays dominantly through its radiative decay mode, Ds*+ → Ds+ γ and through its kinematically allowed decay Ds*+ → Ds+π0 . Other decay modes of Ds*+ doesn't occur at a significant level. This kinematically allowed decay Ds*+ → Ds+π0, violates the isospin symmetry. Many theoretical models predict the branching fractions of these decay modes but the precise measurements of these branching fractions are very important to explore dynamics of QCD and to constrain the parameters of the theoretical models. Previously these branching fractions were measured by CLEO, BaBar and BES III experiments. Belle II provides us the opportunity to improve previous measurements with higher statistics and improved detector performance. In this presentation, we present the feasibility to perform measurement of the branching fraction of Ds*+ → Ds+π0 with respect to Ds*+ → Ds+ γ with Belle II detector.

OP6. PROSPECTS OF MIXING ANGLE MEASUREMENTS IN ELECTROWEAK GAUGE THEORY THROUGH HIGH ENERGY EXPERIMENTS

Maitreyee Mukherjee[1], Vipin Bhatnagar[1], Sushil Singh Chauhan[1]

[1]Panjab University Chandigarh

ABSTRACT

In particle physics, the GWS model of the electroweak (EW) interactions describes the fundamental parameters. One of these important parameters is θ_W, referred as the Weak Mixing Angle. This parameter probes mixing of W and B fields and can be defined as, sin^2 θ_W=(1-(M_W^2)/(M_Z^2)). Due to the difference of the Z boson couplings for left-handed and right-handed fermions, an asymmetry is observed in the angular distribution between the oppositely charged leptons produced in Z-boson decays. This asymmetry depends on the weak mixing angle between the neutral states associated to the U(1) and SU(2) gauge groups. Weak mixing angle is basically the ratio between the coupling constants and is same for all leptons because of lepton universality. Additionally, this measurement is an overall test of the EW sector. This is also an indirect measurement of the mass of the W-boson. So, the precise measurement of the weak mixing angle is a study of immense importance. At present, the two

most precise experimental measurements (LEP, SLD) disagree by about 3σ. In this context, study on asymmetry, effects of parton distribution functions (PDF), higher order effects, etc will be discussed. Also, the discussion will be extended to the experimental analysis of the proton-proton data collected by the CMS detector in the year of 2015 to 2018, at $\sqrt{s}$ =13 TeV. It has been predicted that, extending the pseudorapidity acceptance with the upgraded detectors (in HL-LHC) will significantly reduce both statistical and PDF uncertainties, which will be discussed too.

OP7. EFFECT OF POLYMER ON GROWTH OF METAL OXIDE NANOSTRUCTURES

Rohit[1], Sandeep Kaur[1], Deepika Jamwal[2], Akash Katoch[1]

[1]Centre for Nanoscience and Nanotechnology, Panjab University, Chandigarh, [2]Department of Chemistry & Centre of Advance Studies in Chemistry, Panjab University, Chandigarh

ABSTRACT

The control synthesis of one-dimensional metal oxide nanostructure holds great promise for wide range of applications, including sensors, catalysts and energy storage devices. Among various synthesis method of one dimensional nanostructure, electrospinning is predominant because of its controlled processing parameters. The synthesis parameters such as type of solvent, precursor and type of polymer effects the solution viscosity and provides significant change in the morphology of synthesized nanofibers. In this process, polymer is used as sacrificial template, which plays important role to maintain fibrous structure. Here, we have synthesized Zinc oxide nanofibers by electrospinning method using two different polymers polyvinyl alcohol (PVA) and polyvinylpyrrolidone (PVP). The resulting electrospun nanofiber were subjected to calcination at 600 ℃ for 2 h. The effect of these polymers on the morphology and grain growth of the synthesized Zinc oxide nanofibers was examined. The Zinc oxide nanofibers synthesized using PVA and PVP polymers consists of round and cuboid shape nanograins. The phase, crystallinity, morphology and thermal behaviour of resulting nanofiber was investigated through various characterization techniques and will be discussed in detail.

OP8. EXPLORING NON-EQUILIBRIUM DYNAMICS IN $NdNiO_3$: A REVIEW OF PHASE SEPARATION AND GLASSY STATES

Ruchika[1], Neelu Mahajan[2], Manish Dev Sharma[1]

[1]Department of Physics, Panjab University, Chandigarh, [2]Goswami Ganesh Dutta Dharma College Chandigarh

ABSTRACT

This review explores the fascinating behaviour of $NdNiO_3$, a non-magnetic perovskite oxide, as it undergoes a metal-insulator transition. As the material cools down, it transforms uniquely, forming a phase-separated state of supercooled metallic and insulating phases. What makes this system particularly interesting are its non-equilibrium properties, which include sensitivity to cooling rates and time-dependent behaviours. These characteristics arise from the shift of supercooled metallic phases towards the insulating state. Additionally, during

cooling, a portion of these supercooled phases becomes kinetically trapped in a glassy state, only to reawaken upon heating above 150 K. This review provides a brief exploration of these phenomena, shedding light on the intricate relationship between temperature and thermopower in $NdNiO_3$, and its broader implications for complex oxide materials and emerging technologies.

OP9. STRUCTURAL AND OPTICAL PROPERTIES OF COPPER SELENIDE NANOPARTICLES

Sajjad Hussain[1], Sandeep Kaur[1], Deepika Jamwal[2], Akash Katoch[1]

[1]Centre for Nanoscience and Nanotechnology, Panjab University, Chandigarh, [2]Department of Chemistry and Centre of Advanced Studies in Chemistry, Panjab University, Chandigarh

ABSTRACT

Copper selenide is an important member of the semiconductor-metal chalcogenides family and received significant interest, as exhibits excellent physical and chemical properties like; tunable band gap, catalytic activity, and electrical properties at the nanoscale. Copper selenide exists in different stoichiometric compositions such as CuSe, Cu_2Se and $CuSe_2$ etc. as well as non-stoichiometric Cu2-xSe with various crystallographic forms such as cubic, tetragonal, hexagonal and orthorhombic. Due to its unique composition and properties, copper selenide has been extensively investigated in different applications such as optoelectronics, energy storage, energy generation or conversion and sensors. The selective use of surfactants and the synthesis procedures lead to nanomaterials with different morphology and distinctive properties. Herein, we applied a simple low-cost, scalable, synthesis of copper selenide nanoparticles using a chemical route method (reduction–precipitation process). The amount of surfactant has shown a significant impact on particle size and band gap. The size of the particles varies from 63 nm to 114 nm and the band gap varies from 2.87eV to 2.95 eV by varying the surfactant concentration. The structural, morphological, compositional analysis and optical properties of the copper selenide nanoparticles were investigated and showed that surfactant concentration is important in controlling the size and band gap of copper selenide nanoparticles. The thorough investigation will be discussed in detail.

OP10. RFID-ACTIVATED SOLAR POWERED CELL PHONE CHARGING STATION

Ayushi Mahajan[1], Shruti Rohilla[1], Manish Dev Sharma[1]

[1]Department of Physics, Panjab University, Chandigarh

ABSTRACT

A RFID activated solar powered cell phone charging station is designed with solar tracking capability in this study which provides a green and sustainable solution to the inconvenient times when cell phone batteries get discharged in public places and people may not be able to make calls, use maps, or access important information. This study describes a cell phone charging station that is solely operated through solar power by means of a solar cell which is attached to the charging station through a backup storage battery. The device switches to the battery in low-irradiance conditions. Users activate the charging station by scanning their

RFID cards. This ensures that only authorized users can use the station. The device can be commercialized since it requires an RFID card reader to recognize a user. A sun tracker is installed to the solar panel to automatically direct the panel for maximum energy harnessing. The study can be used in railway stations, bus stands for the public when they are in need and rural areas where the power grid is not available at partial/full time. It will help promote sustainable energy practices and reduce carbon emissions. In future, the study can be scaled up for charging of higher wattage devices.

OP11. INTRODUCING PARTICLE PHYSICS AT THE LARGE HADRON COLLIDER FOR M.SC. STUDENTS THROUGH HANDS-ON EXPERIMENTS

Sunil Bansal[1], Keshav[2], Himanshu Bansal[2]

[1]UIET Chandigarh, [2]Physics Department Panjab University Chandigarh

ABSTRACT

High Energy Physics (HEP) stands as one of the most rapidly expanding fields in the realm of sciences. At the forefront of HEP research is the Large Hadron Collider (LHC), the world's largest experiment, continuously pushing the boundaries of our understanding of the universe. This presentation introduces an innovative educational approach aimed at M.Sc. Students, providing them with a hands-on experience of the physics transpiring at the LHC. We present an experiment module designed within the ISPY framework titled "Identification of Z Boson at CMS Detector at LHC and Calculation of Invariant Mass and Width of Z Using Kinematic Parameters of Its Decay Products." This module equips students to delve into the intricate world of particle physics by actively engaging with the current experiments taking place at the LHC. It enables a comprehensive comprehension of both the LHC and CMS, a key particle detector at the LHC. To facilitate this experiment, participants will need to install the ISPY software, which recreates the CMS environment faithfully. Additionally, they have to access and utilize open data from CERN's website. This practical approach empowers students to perform the experiment with ease, fostering a deeper understanding of the fundamental principles underpinning particle physics. This initiative not only broadens horizons of the students but will familarize them with current experimental High Energy Physics happening at LHC.

OP12. EMERGING FRONTIERS OF CRYOGENIC TECHNOLOGY

Nazam[1]

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ABSTRACT

The cryogenic industry deals with the science of extremely low temperatures ranging from 125K to 0K. The change in properties of the material at such low temperatures is studied and its versatile applications in the fields of superconductivity, rocket engines, cryopreservation, cryoelectronics, and cryostorage are discussed in detail. The techniques used to achieve these ultra-low temperatures are analyzed and the process of liquefaction of helium, nitrogen, and hydrogen is discussed. The storage and transportation methods of cryogenic materials are also

examined. Applications in the field of superconducting magnets like the ones used in LHC at CERN which operates at nearly 0K temperatures are discussed. Furthermore, the cryogenic stage in rocket engines is discussed in detail with an emphasis on India's indigenous cryogenic engine (CE-20) used in GSLV during the Chandrayan-3 mission. More worldwide applications like human organ preservation, MRI technology, food preservation, fuel storage, and transportation, using low-temperature technology are also briefly touched upon. Beyond that, the future scope of the cryogenic industry in the fields of quantum computing, fusion energy systems, carbon capture and storage systems, and cryogenic propulsion systems are discussed, thus describing the broad spectrum of research in this emerging field.

OP13. SOLAR-POWERED MOBILE PHONE CHARGING STATION WITH RFID ACTIVATION AND SOLAR TRACKING

Shruti Rohilla[1], Ayushi Mahajan[1], Manish Dev Sharma[1]

[1]Department of Physics, Panjab University, Chandigarh, India

ABSTRACT

This study proposes a sustainable solution to the problem of mobile phone batteries running out of power at inconvenient times in public places. The proposed solution is a solar-powered mobile phone charging station with RFID activation and solar tracking. The charging station will be powered by a solar cell that is connected to a backup storage battery. The device will switch to the battery to ensure that it can charge cell phones even in low-light conditions. Users will be able to activate the charging station by scanning their RFID cards. RFID restricted the authorized access of the charging stations. A sun tracker will be installed on the solar panel to automatically direct the panel towards the sun for maximum energy harvesting.

OP14. PAPER SUPERCAPACITOR FABRICATION VIA INKJET-PRINTED CARBON NANOTUBES INK

Uday Karanbir Singh[1], Richa Rastogi[1], Pushpinder Kaur[2]

[1]Centre for Nanoscience & Nanotechnology, South Campus, Panjab University, Chandigarh, [2]Sri Guru Gobind Singh College, Sector 26, Chandigarh

ABSTRACT

In the pursuit of advanced energy storage solutions, this study presents an approach to the fabrication of supercapacitors using inkjet printing technology and a highly conductive Carbon Nanotube (CNT) ink. Supercapacitors have gained significant attention due to their ability to store and rapidly release energy, making them vital components in a wide range of portable and wearable electronic devices. However, their integration into flexible and lightweight applications has posed challenges, and this research addresses these issues head-on. The key innovation lies in the formulation of a specialized CNT ink, optimized for inkjet printing. The ink's rheological properties enable precise and controlled deposition of CNTs onto paper substrates, allowing for the creation of custom-designed electrode patterns. These electrodes exhibit exceptional electrical conductivity 5.55*10-6 Siemens/m. The supercapacitor was fabricated by inkjet printing the electrodes using carbon nanotube ink and Phosphoric Acid doped Polyvinyl Alcohol (PVA) as gel electrolyte. The fabricated supercapacitors were

thoroughly characterized using cyclic voltammetry. Charge/discharge Characteristics were also measured for evaluating supercapacitor performance. Specific capacitance was calculated for various devices in series and parallel combinations as well. This study introduces an innovative approach to fabricating flexible supercapacitors using CNT ink via inkjet printing, addressing the pressing need for efficient and adaptable energy storage solutions in modern electronics.

OP15. SCHOTTKY DIODES AS SENSORS: A COMPREHENSIVE REVIEW

Gurnoor Kaur[1], Brijesh Kumar[1], Saroj Bala[2]

[1,2]*Authors*

ABSTRACT

Schottky diodes have emerged as versatile electronic components with remarkable potential in the field of sensors and detection systems. This abstract presents a comprehensive overview of the utilization of Schottky diodes as sensors for various applications. The unique electrical characteristics of Schottky diodes, arising from their metal-semiconductor junction, enable them to exhibit exceptional sensitivity to changes in temperature, light, gas composition, and radiation. The paper delves into the fundamental principles governing Schottky diode operation as sensors, highlighting their rapid response, low power consumption, and compatibility with modern microfabrication techniques. Additionally, this abstract, sheds light on the integration of Schottky diodes into diverse sensing platforms, such as temperature sensors, photodetectors, gas sensors, and radiation detectors. Challenges related to calibration, signal processing, and minimizing noise are discussed alongside emerging trends in enhancing the performance and selectivity of Schottky diode sensors. In conclusion, Schottky diodes represent a promising avenue in sensor technology, offering a unique blend of sensitivity, speed, and versatility. As this review demonstrates, their application spans various domains, with ongoing research poised to unlock new possibilities for precision sensing in diverse fields.

OP16. I-V CHARACTERISTICS OF SCHOTTKY DIODES: A REVIEW

Neeraj Gupta[1], Saroj Bala[2]

[1,2]*Authors*

ABSTRACT

The I-V (current-voltage) characteristics of Schottky diodes are of great importance in understanding and analysing its behaviour for various electronic applications. Review highlights into the fundamental aspects of I-V characteristics exhibited by Schottky diodes. The I-V characteristics of Schottky diodes exhibit distinctive behaviour due to the unique physics of their metal- semiconductor junction. Understanding the I-V characteristics is essential for designing and optimizing Schottky diode-based circuits. Engineers and researchers can utilize these characteristics to tailor the diode's performance to specific applications, such as rectification, high-frequency signal detection, and power conversion. Furthermore, the exploration of temperature effects on I-V characteristics provides insights

into the thermal stability and reliability of Schottky diodes in various operational environments. The work concludes that the I-V characteristics of Schottky diodes define their operational behaviour and utility in diverse electronic applications. Their unique attributes, such as fast switching speeds, low forward voltage drop, and abrupt breakdown, differentiate them from conventional diodes.

ABSTRACTS OF POSTER PRESENTATIONS

PARTICIPANTS

S. No.	Name of participant	Affiliating institution	Title of abstract
1.	Pooja Kaushal	Centre for Medical Physics, Panjab University, Chandigarh, India, 160014	Role of deformations and orientations in the decay of Silver-105
2.	Aveksha Sharma	Centre for Nanoscience & Nanotechnology, South Campus, Panjab University, Chandigarh	Enhancing photoluminescence in Cs_2SnCl_6 double perovskite via bismuth
3.	Anita Rani	Guru Nanak College Sri Muktsar Sahib	Dft study of electronic and magnetic properties of Ca1-xCR$_x$S and Ca1-xCr$_x$Se AT x = 0.125
4.	Amninderjeet Kaur	Department of Physics, Panjab University, Chandigarh	Neutron multiplicity as a probe to study the effect of entrance channel and angular momentum on fusion-fission dynamics
5.	Bhawana Chauhan	Department of Physics, Panjab University, Chandigarh	Gas Electron Multiplier (GEM) detectors and its applications in medical imaging
6.	Chaitanya Kumar	Centre for Nanoscience and Nanotechnology, Panjab University, Chandigarh	Meta-analysis of toxicological impact of micro/nano plastics on zebrafish
7.	Versha Rani, Chirag Garg	Department of Physics , Panjab University Chandigarh	Revisiting Fritzsch like texture specific mass matrices
8.	Gurjit Kaur	Department of Physics, Panjab University, Chandigarh	Constraints on the elements of the extended quark mixing matrix
9.	Kritika Rajput	Department of Physics, Panjab University, Chandigarh	Catalytic degradation of nitroaromatics using Ag nanostructures decorated meso-composite
10.	Neha Dhanda	Panjab University	Probing of fission time scale through neutron multiplicity measurement of 204pb
11.	Ritu	Department of Physics, PU, Chandigarh	Optical properties of chalcogenide glasses: A comprehensive review
12.	Sajal Shradha	Department of Physics, Panjab University, Sector 14, Chandigarh, India	Synthesis and characterization of free standing PVDF-MoS_2 polymer nanocomposites

13.	Sakshi Saini	Department of Physics, Panjab University, Chandigarh	Comparative study of environment friendly synthesis of reduced graphene oxide using natural extracts for fuel cells
14.	Sunidhi	Department of Physics, Panjab University, Sector-14, Chandigarh -160014, India	Influence of epitaxial strain on structural and vibrational properties of $LaNiO_3/LaAlO_3$ oxide heterostructure
15.	Manish Kumar	IISER Mohali	Discovery of rare decays at the Belle experiment
16.	Ojas Garg	Department of Physics, Baba Mastnath University, Rohtak	Crystallographic and photoluminescent study of green light emitting BBYO nanophosphor for advanced optical devices
17.	Pawanpreet Kour	Department of Physics, School of Basic Sciences, Central University of Punjab, Bathinda-151401, Punjab, India	Mixed-phase MoS_2 nanosheets anchored carbon nanofibers for advanced energy storage applications
18.	Simran Kour	Department of Physics, Central University of Punjab, Bathinda-151401, Punjab, India	All-redox hybrid supercapacitors based on carbon modified stacked zinc cobaltite nanosheets
19.	Sourabh Chutia	IISER Mohali	Study of radiative decays of the exotic state X(3872) using the Belle and the Belle II detectors
20.	Anupriya Choudhary	Department of Physics, Panjab University, Chandigarh	Gravitational Waves

PP1. ROLE OF DEFORMATIONS AND ORIENTATIONS IN THE DECAY OF SILVER-105

Pooja Kaushal[1]

[1] *Centre for Medical Physics, Panjab University, Chandigarh, India, 160014*

ABSTRACT

Quantum mechanical fragmentation theory is employed to study the possible decay mechanisms of the hot and rotating compound nucleus $^{105}Ag^{*}$ for the center-of-mass energy range 61.38 - 89.97 MeV. Within the dynamical cluster-decay model, the decay of $^{105}Ag^{*}$ has been studied by including the effects of spherical and quadrupole deformations with optimum orientations. As a next step, the impact of higher-order deformations (upto hexadecapole) with corresponding compact orientations is analyzed within the purview of non-coplanar degree-of-freedom. An attempt is made to systematically study the impact of inclusion of deformations and non-coplanarity on the decay of the odd mass compound nucleus. A detailed analysis of variations in preformation and penetration probabilities with fragment mass number is done for all the three above mentioned configurations. These most probable fragments are determined from the fragmentation potential plots wherein the former are minimized. The fusion evaporation cross-sections are calculated for the reaction $^{37}Cl+^{68}Zn$, using the only parameter of the model, viz., the neck length parameter. The point of penetration and exit of outgoing channel is fixed by the barrier lowering parameter in the scattering potential plots. This parameter varies smoothly with the temperature of the compound nucleus at both below- and above-barrier energies. The DCM calculated fusion evaporation cross-sections are compatible with the experimental data. A comparative study of the barrier lowering parameter as a function of fragment mass is done for various configurations of entrance and exit channel nuclei.

PP2. ENHANCING PHOTOLUMINESCENCE IN Cs_2SnCl_6 DOUBLE PEROVSKITE VIA BISMUTH

Jadab Sharma[1], Aveksha Sharma[1]

[1]*Centre for Nanoscience & Nanotechnology, South Campus, Panjab University, Chandigarh*

ABSTRACT

Double perovskite materials have garnered significant attention due to their exceptional optoelectronic properties. In this poster presentation, we explore the modification of Cs_2SnCl_6, a promising candidate for next-generation solar cells and optoelectronic devices, through doping with bismuth (Bi) and ytterbium (Yb) ions. Our investigation focuses on the effects of Bi and Yb doping on the structural and optical properties of Cs_2SnCl_6.We synthesized a series of samples with varying concentrations of Bi and Yb dopants and characterized them using X-ray diffraction (XRD), scanning electron microscopy (SEM), and photoluminescence spectroscopy. XRD analysis revealed changes in the crystal structure, while SEM images displayed the morphological evolution induced by the dopants. This work offers insights into the potential of Bi and Yb-doped Cs_2SnC1_6 as efficient luminescent materials for light-emitting diodes and other optoelectronic applications. Furthermore, it highlights the significance of engineering the electronic properties of double perovskite materials for

advanced device development.Within the Cs_2SnCl_6 lattice, we investigate the mechanisms underlying this enhancement, shedding light on the role of Bi and Yb ions in altering the electronic structure and recombination pathways.

PP3. DFT STUDY OF ELECTRONIC AND MAGNETIC PROPERTIES OF Ca1-xCR$_x$S AND Ca1-xCr$_x$Se AT x = 0.125

Anita Rani[1]

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ABSTRACT

Using density functional theory, the structural, magnetic, and electronic properties of the Cr doped diluted magnetic semiconductors Ca1-xCr$_x$S and Ca1-xCr$_x$Se at x = 0.125 in the B1 (NaCl) phase are explored. Elastic constants and structural properties (lattice constants, bulk modulus, and its pressure derivative) were calculated and used to establish structure stability. Plots of the TDOS and PDOS of transition metal atom doped CaZ at x = 0.125 and pure CaZ (Z = S, Se) are presented. Cr-doped CaZ (Z = S, Se) shows half-metallic character at x = 0.125 and is stable in ferromagnetic state. The current results are in excellent agreement with earlier research. Our current findings imply that CaZ doped with Cr (Z = S, Se) would make a promising option for spintronic applications.

PP4. NEUTRON MULTIPLICITY AS A PROBE TO STUDY THE EFFECT OF ENTRANCE CHANNEL AND ANGULAR MOMENTUM ON FUSION-FISSION DYNAMICS

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ABSTRACT

In the present study, pre-scission neutron multiplicities have been calculated theoretically for the systems 48Ti+124Sn, 19F+153Eu, 28Si+142Nd, 12C+158Er, 28Si+142Ce, 16O+154Gd, and 48Ti+122Sn, populating the compound nucleus 172Hf, 170W, and 170Hf respectively. These calculations are performed in the energy range of 50 – 80 MeV by including the shell effect in the level density and shell correction to the fission barrier height. Pre-scission neutron multiplicities are calculated using the statistical model code VECSTAT [1]. This model states that once the projectile and target nucleus interacts with each other a fully equilibrated CN is formed i.e. it neglected the phenomenon of non-compound nucleus events like fast-fission and quasi-fission. Dynamical model calculations are performed using the HICOL code [2] to calculate the maximum value of angular momentum lmax which contribute to fusion. In the present work, the effect of entrance channel mass-asymmetry and angular momentum on fusion-fission dynamics are studied. From these calculations, we observed that at lower excitation energy entrance channel effect dominates but at higher excitation energies angular momentum effect dominates. We also studied the effect of Coulomb repulsion on pre-scission neutron multiplicities and we observed that as ZpZt increases, pre-scission neutron multiplicities increase up to a particular value of ZpZt after that it starts decreasing.

References

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PP5. GAS ELECTRON MULTIPLIER (GEM) DETECTORS AND ITS APPLICATIONS IN MEDICAL IMAGING

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ABSTRACT

Gas Electron Multiplier (GEM) Detector was introduced by F. Sauli in 1997, which is a composite grid consisting of two conducting layers separated by a thin insulator (i.e. Kapton/Apical) etched with a regular matrix of open channels. GEM is the type of Micropattern gaseous detectors (MPGD) which is used to detect and characterize ionizing radiation such as charged particles or photons.The unique aspect of these detectors is the use of micro-patterned structures within the gas volume to facilitate the precise localization of ionization events within the detector. Presently, CERN is the main distributor of small as well as large area GEM foils. But to meet the future requisites, Micropack (a Bengaluru-based company) Pvt. Ltd. India has acquired a license from CERN to manufacture and commercialize GEM foils. It has established and commercialized GEM foils for the first time in India. Currently, Micropack has successfully produced double-mask GEM foils of 10 cm ×10 cm size. Moreover several Indian Institutions, including the Panjab University Chandigarh, are part of the muon detector upgrade project of the CMS experiment at the Large Hadron Collider (LHC). Detectors built using these foils prove to be one of the most promising particle detectors in various scientific fields such as high-energy physics experiments, medical imaging, in Industrial / Environmental monitoring astrophysics, and nuclear physics research. This is due to their excellent position resolution, good timing, high rate detection capabilities, low ion backflow, design flexibility and large area coverage.

PP6. META-ANALYSIS OF TOXICOLOGICAL IMPACT OF MICRO/NANO PLASTICS ON ZEBRAFISH

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ABSTRACT

The concerns regarding ecological and biological effects of microplastics (MPs) and nano-plastics (NPs) have grown significantly as a result of widespread use of plastics in lifestyle. Zebrafish (Danio rerio) has recently become an important model organism for evaluating the toxicity of these MPs/NPs due to their sensitivity, genetic similarity to humans, and transparent embryos. In the present work, we extensively examined the previous literature on the toxicological effects of MPs/NPs on zebrafish. By literature search, we collected and analyzed data from a wide range of research that looked into the effects of MPs/NPs exposure on

zebrafish at different developmental stages. The research that are included cover a wide range of endpoints, such as mortality, growth restriction, behavioral modifications, molecular responses, histopathological abnormalities, and physical abnormalities in different organs. We collected and compared these results in an effort to find common themes and patterns among different investigations. The severity of these effects varies based on the particle size, concentration, type of plastic particles, and zebrafish developmental stage. It also revealed changes in the gene expression patterns linked to oxidative stress and inflammation. This showed that the molecular effects of MPs/NPs' toxicological effects go beyond physical and behavioral alterations. This meta-analysis emphasizes the need for quick action to solve this environmental problem by providing a thorough summary of the present state of research on the toxicological effects of MPs/NPs on zebrafish. The results highlight the value of further study to comprehend the entire range of ecological effects and potential threats.

PP7. REVISITING FRITZSCH LIKE TEXTURE SPECIFIC MASS MATRICES

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ABSTRACT

At present, it seems that fermion masses and mixings provide a fertile ground to hunt for physics beyond the SM as well as pose a big challenge to understand these from more fundamental considerations. It may be noted that mixing angles and CP violating phases are very much related to the corresponding mass matrices, therefore, in view of this relationship, one has to essentially formulate the fermion mass matrices to unravel some of the deeper aspects of flavor physics. The mass matrices, having their origin in the Higgs fermion couplings, are arbitrary in the SM, therefore the number of free parameters available with a general mass matrix is larger than the physical observables. To this end, the idea of texture zero mass matrices wherein some of the entries of the mass matrices were proposed to be zero, as a result, a fewer number of free parameters imparted more predictability to mass matrices. In a very recent paper entitled, ' Correlations between quark mass and flavor mixing hierarchies ' by Fritzsch et.al. (Nucl Phys B 115634, 2022) have explored the additional parameter space available to the elements of texture 4 zero mass matrices in contrast with parameter space considered in the earlier attempts. In the present work, we have extended and investigated in detail some of the ideas explored in the above reference. In particular, we have found the entire range of the viability of hierarchy defining parameters in the context of presently refined data.

PP8. CONSTRAINTS ON THE ELEMENTS OF THE EXTENDED QUARK MIXING MATRIX

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ABSTRACT

In the context of quark mixing phenomenon, understanding Cabbibo-Kobayashi-Maskawa (CKM) matrix and related phenomenology has important implications for the Flavor Physics including discovery of physics beyond the Standard Model. Inspite continuous refinements in the data, the CKM phenomenology has been saddled with several persistent 'anomalies', such as significant difference between the exclusive and inclusive values of V_ub and V_cb, divergence of unitarity of first row of CKM matrix and others. To explain these `anomalies', one possible way is to increase the number of fermion generations. The assumption to add particles b′ and t′ (down-like quark and up-like quark respectively), having the same quantum numbers as their Standard Model partners enlarges the 3 generation CKM quark mixing matrix to the 4 generation CKM matrix referred to as VCKM4. This leads to the fourth column elements being V_ub′, V_cb′, V_tb′ and V_t′b′ and fourth row elements being V_t′d, V_t′s, V_t′b and V_t′b′. In the present work, we have attempted to find constraints on the fourth row and fourth column elements of the fourth generation CKM matrix. Our analysis reveals that, using unitarity one obtains useful constraints on these elements, which are in agreement with the constraints given in literature as well as the so-called anomalies can be taken care of.

PP9. CATALYTIC DEGRADATION OF NITROAROMATICS USING AG NANOSTRUCTURES DECORATED MESO-COMPOSITE

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ABSTRACT

Nano-porous materials particularly, the mesoporous silica materials have been the pivot of scientific attention owing to their exceptional surface structural properties such as high surface area, tuneable pore diameters, and high thermal and mechanical stability. The current study involved the synthesis of Ag nanostructures decorated amine-modified mesoporous silica KIT-6 nanocomposites by using the post-functionalization methodology. Various analytical techniques like nitrogen sorption isotherms, Powder XRD, SEM, and SAXS confirmed the successful incorporation of Ag metal on the mesoporous support. HR-TEM studies revealed that the change in the morphology of the embedded Ag nanoparticles from Nanospheres to Nanorods was controlled by the amount of Ag loading. The catalytic efficiency of the prepared nanocomposites varied depending upon the dispersibility and amount of Ag impregnation. The prepared nanocomposites were evaluated as heterogeneous catalysts for the degradation of trinitrophenol with Ag (1.5)/(ap)-KIT-6 exhibiting the highest degradation efficiency among

the synthesized materials. Efforts are being done to further improve the degradation of the TNP by varying the synthesis conditions.

PP10. PROBING OF FISSION TIME SCALE THROUGH NEUTRON MULTIPLICITY MEASUREMENT OF 204PB

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ABSTRACT

In present work, we calculated the pre-scission neutron multiplicity of Heavy ion induced reactions using the statistical model code JOANNE2. In the Joanne2 code, transient time (τtr) and saddle to scission time (τssc) can be obtained by taking transmission coefficients and particle binding energies into account. This work includes statistical model calculations evaluated by Joanne2 code which is further compared with the available experimental data for the 18O + 186W reaction. A compound nucleus is produced in an excited state when a projectile is captured by a target, it can decay through the two different mechanisms: particle evaporation and fission. Even though the composite system may survive initially after the emission of one or more particles. The emission of these particles from a composite system before fission known as pre- scission particle multiplicity. The fission fragments are emitted in excited state and decay subsequently through the emission of light particles and ɣ rays. These particles are known as post-scission particles. The relationship between pre-scission neutron with the excitation energy (E*) and saddle to scission transient time has been investigated herein. We observed the pre-scission neutron multiplicity increases with an increase in excitation energy. We have ascertained that there is an increase in τssc with increase in prescission neutron multiplicity.

PP11. OPTICAL PROPERTIES OF CHALCOGENIDE GLASSES: A COMPREHENSIVE REVIEW

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ABSTRACT

Chalcogenide glasses have garnered significant attention due to their uniqueoptical properties, making them promising candidates for various photonics and optoelectronic applications. These glasses, composed primarily of chalcogenide elements such as sulfur, selenium, and tellurium, exhibit exceptional infrared transparency and possess a wide range of tunable optical properties. This abstract provides an overview of the optical characteristics of chalcogenide glasses, including their transparency window, refractive index, dispersion, nonlinear optical behavior, and photo-induced effects. The distinct composition-dependent optical properties of chalcogenide glasses enable their use in diverse fields such as fiber optics, integrated photonics, sensors, and laser systems. This review summarizes recent advances in understanding and exploiting the optical properties of chalcogenide glasses, highlighting their potential for driving innovations in modern optics and photonics technologies.

PP12. SYNTHESIS AND CHARACTERIZATION OF FREE STANDING PVDF-MoS_2 POLYMER NANOCOMPOSITES

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ABSTRACT

PVDF is good semi-crystalline piezoelectric polymer, which could be used as smart material such as sensor,actuator or energy harvesting device.to enhance the piezoelectric property of PVDF is incorporation of filler or nanomaterial's such as graphene oxide, titanium dioxide, nanoclay and MoS_2 into the PVDF which acts as nucleating agent and improves the β phase and piezoelectric performance. In this work, exfoliated molybdenum disulfide nanosheets were sythensized from bulk MoS_2 using liquid phase exfoliation methods. Then MoS_2 based PVDF nanocomposite films are fabricated by using solution casting method with varying MoS_2 fractions (0, 0.2, 0.4, 0.6, 0.8, 1 and 2 wt%) giving the free standing flexible films. UV-vis Spectroscopy at 612nm and 675 nm which confirmed the formation of exfoliated MoS_2. Raman Spectra of exfoliated MoS_2 shows the two characteristic bands of E2g band at 385 cm-1 and the A1g band at 408 cm-1. XRD of MoS_2-PVDF nanocomposite films shows the dominance of beta phase in all the composites formed. The three major Raman modes at 798, 812 and 839 cm-1 of PVDF corresponding to alpha, gamma and beta phase are present in all the samples with ratio of intensity of Iα to Iβ <1 which confirms that the dominance of beta phase. These flexible free standing films can be used in energy harvesting applications.

PP13. COMPARATIVE STUDY OF ENVIRONMENT FRIENDLY SYNTHESIS OF REDUCED GRAPHENE OXIDE USING NATURAL EXTRACTS FOR FUEL CELLS

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ABSTRACT

Traditional methods of powering the world include the extraction of energy from non-renewable energy resources namely coal, petrol, natural gas, etc. To sustain the daily demands, these resources are not sufficient and researchers are looking for alternative ways to produce energy at a lower expenditure. One such class of energy devices is fuel cells which have attracted much attention in the past few decades. Fuel cells are electrochemical devices that convert chemical energy into electrical energy and this energy can be utilized in situ to power the devices. A typical fuel cell consists of fuel and catalyst sandwiched between electrodes. The development of electrodes for fuel cells has been a challenging part. Reduced graphene

oxide is one of the promising candidates as a support material for electrodes which not only provides support but also enhances catalytic activity. Synthesis of reduced graphene oxide involves two steps: synthesis of graphene oxide followed by reduction of graphene oxide. Earlier graphene oxide was synthesized by Hummer's method and reduced by the use of harsh chemicals like hydrazine hydrate. The residual chemicals left out from this process are generally discarded into the open environment causing serious environmental issues. This manuscript focuses on the alternate methods to produce reduced graphene oxide solely from natural materials.

PP14. INFLUENCE OF EPITAXIAL STRAIN ON STRUCTURAL AND VIBRATIONAL PROPERTIES OF $LaNiO_3/LaAlO_3$ OXIDE HETEROSTRUCTURE

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ABSTRACT

Lanthanum Nickelate ($LaNiO_3$) is the only perovskite which shows no Metal to Insulator transition and manifest the metallic behavior at all temperatures. This fascinating property made it a suitable candidate for electrode applications for oxide-based electronics. Here, we deposited the $LaNiO_3$ epitaxial thin film of different thicknesses on LAO (001) substrate using Pulsed laser deposition technique i.e., 4000 laser pulses, 1000 laser pulses, 500 laser pulses. The temperature and oxygen pressure used for their growth were 700°C and 0.46 mbar, respectively. The structural and vibrational properties were studied using XRD and Raman spectroscopy. The XRD results confirms that films are epitaxial in nature for all the three different thicknesses. With increase in the number of laser pulses from 500 to 4000, the out-of-plane lattice parameter decrease from 3.89 Å to 3.83 Å indicating the compensation of epitaxial strain (from 1.56 % to 0 %). The Raman measurements shows the presence of A1g and Eg modes as characteristics Raman active phonon modes of $LaNiO_3$. Both the modes show shift towards lower wavenumber due to variation in epitaxial strain. The dominant shift with thickness is seen for Eg mode from 415.9 cm-1 for 500 laser pulses to 401.6 cm-1 for 4000 laser pulses which shows that epitaxial strain is mainly compensated through change in Ni-O bond length in NiO_6 octahedra rather than octahedral tilt or rotation.

PP15. DISCOVERY OF RARE DECAYS AT THE BELLE EXPERIMENT

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ABSTRACT

We will present the study of rare decay modes B^{+} o D_{s}^{*+}h^{0} and B^{+} o D^{+}h^{0}, where h^{0} denotes the neutral mesons (η and K^{0} using a data sample of

the Belle experiment. These rare decay modes are poorly measured in the world, and we first time studied them using the full Belle data collected at an asymmetric KEKB e^{+}e^{-} collider situated at Tsukuba, Japan. Along with rare decay modes, we will report improved measurements in the branching fraction of the color-suppressed decays B^{0} o D^{0} h^{0}. In the absence of a significant signal yield, an upper limit at the 90% confidence level is given for each signal decay mode. We present the first search result for the B^{+} o D^{+}η decay mode. The obtained upper limits are 20 times more stringent than the previous one. We report the most precise measurement to date of the branching fraction for the B^{0} o D^{0}K^{0} decay mode.

PP16. CRYSTALLOGRAPHIC AND PHOTOLUMINESCENT STUDY OF GREEN LIGHT EMITTING BBYO NANOPHOSPHOR FOR ADVANCED OPTICAL DEVICES

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ABSTRACT

A sequence of terbium-activated BBYO nanophosphor was fabricated with the aid of solution combustion (SC) methodology. The cubic crystal structure with space group Fm-3m was confirmed by the Rietveld refinement technique based on X-ray diffraction analysis. Crystallite size dispersion and morphological features were examined by Scanning Electron Microscopy (SEM) and Transmission Electron Microscopy (TEM) techniques. SEM Energy Dispersive System (EDS) provided a clue about elemental composition in the prepared host lattice. Energy-gap analysis was carried out using the Kubelka-Munk theory with diffuse reflectance spectra. Photoluminescence investigations revealed a bright green emission at 545 nm in the visible region on excitation by a NUV light source. The green color was a result of 5D4→7F5 electronic transition. The concentration quenching mechanism in the prepared nanophosphor was studied with the help of Dexter's theory as well as I-H model generalization, where, multipolar interactions were found to be responsible for the same. Quantum efficiency was found to be 84 % for the optimal sample. Further, CIE and CCT coordinate confirmed an efficient green emission that enhances its application vision in optical appliances such as optoelectronic devices, solar cells, lasers, and pc-WLEDs. Keywords: Nanophosphor, Quantum efficiency, CCT.

PP17. MIXED-PHASE MoS_2 NANOSHEETS ANCHORED CARBON NANOFIBERS FOR ADVANCED ENERGY STORAGE APPLICATIONS

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ABSTRACT

The increasing energy demands of modern technology driven society have led to extensive research on energy storage systems such as supercapacitors. For the superior performance of supercapacitors, efficient electrode materials are highly required. In this regard, mixed-phase *MoS2* (MS) nanosheets anchored carbon nanofibers (CNFs) have been synthesized via a hydrothermal route. The concentration of CNFs has been varied in the MS/CNF-x composite (where, x = 1, 1.5, 2, and 3 represents the molar concentration of CNFs) to investigate the impact of CNFs on the electrochemical behavior of the material. The incorporation of CNFs offers a conductive path for the diffusion of ions and provides structural support which limits the restacking of the *MoS2* layers during the charging/discharging. The MS/CNF-2 composite delivered superior electrochemical performance compared with the other composites owing to the positive synergy between *MoS2* and CNF. The specific capacitance manifested by MS/CNF-2 (626.08 F g-1 at 1 A g-1) is about four times that of pristine MS (159.35 F g-1). It is also observed that MS/CNF-2 exhibited higher electrochemical stability than pristine MS. Furthermore, the symmetric supercapacitor achieved a tremendous energy density of 42.6 Wh kg-1 at 2.4 kW kg-1. To test its practical applicability, LEDs of different color (red, green, and blue) have been illuminated using a series combination of three symmetric electrode cells. The red, green, and blue LEDs lighted up for 15 min, 7 min, and 3 min. The results demonstrate the superiority of the MS/CNF composite for symmetric supercapacitors.

PP18. ALL-REDOX HYBRID SUPERCAPACITORS BASED ON CARBON MODIFIED STACKED ZINC COBALTITE NANOSHEETS

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ABSTRACT

The role of energy in the present century has increased with the fast advancement of the global economy. In this regard, hybrid supercapacitors (HSCs) as energy storage systems have become an extensive research focus worldwide. This study reports the synthesis of carbon-loaded $ZnCo_2O_4$ stacked nanosheets via an in-situ hydrothermal process followed by annealing. The electrochemical response was tested in a 2-electrode system. The optimized composite exhibited ~527.6 F g-1 of capacitance at 5 mV s-1. The symmetric SC (SSC) possessed an energy density of ~17.3 Wh kg-1 corresponding to a power density of 2.25 kW kg-1. Two asymmetric all-redox HSCs have also been fabricated using optimized composite material as the positive electrode. The $MnCo_2O_4$/AC (HSC1) and MnO_2/AC (HSC2) were taken as negative electrodes. The HSC1 exhibited ~24.4 Wh kg-1 of energy density

corresponding to ~0.8 kW kg-1 of power density. On the other hand, the HSC2 exhibited highest energy density of ~30.8 Wh kg-1 at 2.4 kW kg^{-1}. The real-time application of the composite is tested with the fabricated HSCs. HSC1 exhibited a capacitive retention of ~72.2% after 10,000 cycles. On the other hand, HSC2 exhibited ~73.4% of capacitive retention after 10,000 cycles. The SSC, HSC1, and HSC2 illuminated a 39 red LEDs panel for ~3 min, 7 min, and 13 mins., respectively. The results suggested the promising performance of all-redox HSCs. The overall results present a sustainable approach for creating hierarchical energy materials for the construction of future energy-storage systems.

PP19. STUDY OF RADIATIVE DECAYS OF THE EXOTIC STATE X(3872) USING THE BELLE AND THE BELLE II DETECTORS

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[1] *IISER Mohali*

ABSTRACT

The exotic state *X(3872)* was discovered by the Belle collaboration in 2003. We plan to measure the branching fractions $X(3872)\rightarrow J/\psi\gamma$ and $X(3872)\rightarrow\psi(2S)\gamma$ using the B meson data collected at the $\Upsilon(4S)$ resonance by the Belle and the Belle II detectors located at Tsukuba, Japan. This will help us narrow down the internal structure of the state. A Monte Carlo study of the decay modes $B\rightarrow(J/\psi\gamma)K$ and $B\rightarrow(\psi(2S)\gamma)K$ is presented here.

PP20. GRAVITATIONAL WAVES

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ABSTRACT

The marvel of humanity has propelled us to study as well as observe the cosmological information from across the universe in the last century. The evidence of cataclysmic events is propagated not only through electromagnetic field but also via the very essence in which matter exists i.e., the fabric of space-time. The newly unveiled outlook known as the Gravitational waves has brought us much closer to study the observable universe via vibrations in the fabric encompassing the cosmos. Our purpose through the poster presentation is to express how the existence of Gravitational waves confirms the dimensionality of our known universe through illustrations. Moreover the journey of how the simplest of detection instruments through rigorous technological advancement is capable of hearing the miniscule pulsation of the curvature of space-time. In addition, the recently proposed LIGO-India collaboration is also of interest to our presentation. The non flatness of the scaffolding of our reality through analogy based depiction. Moreover we also hope to shine light on the stochastic background of gravitational waves.

SHODH SAMVAD

PARTICIPANTS

S. No.	Name of participant	Affiliating institution	Title of abstract
1.	Akanksha Sharma	Department of Biophysics, Panjab University Chandigarh	Dynamics landscape of CssA RNA thermometer from Neisseria meningitidis via integrative approaches
2.	Akshpreet Kaur	EEE Department, UIET, Panjab University, Chandigarh	Energizing tomorrow: Unveiling triboelectric nanogenerators' potential
3.	Ashmita Biswas	Institute of Nano Science and Technology, Sector-81, Knowledge City, Mohali-140306, Punjab, India	Green production of clean fertilizers: A win-win situation for scientists and farmers
4.	Bunty Sharma	CIL/SAIF/UCIM, Panjab University, Chandigarh, 160014, India	Engineered biocompatible dual-charge metallocatanionic vesicles encapsulating photosensitizer formulations for efficient photodynamic therapy
5.	Deepti Chaudhary	Department of Zoology, Panjab University, Chandigarh	Electromagnetic pollution: A new challenge for the world
6.	Diksha Sharma	University Business School, Panjab University, Chandigarh	Innovative minds, resilient companies, stronger communities: The societal significance of intellectual capital, governance and family on business performance
7.	Himanshu Anand	Community Medicine department, Dr Br Ambedkar State Institute of Medical Sciences, Mohali, Sas Nagar, Punjab	Patients understanding of medical prescription instructions (pumpi): A critical touch point for optimizing therapeutic outcomes in rural communities
8.	Kiran Rani	Department of Zoology, Punjab Agricultural University, Ludhiana, Punjab	Repellent based formulation: A boon for farmers against mammalian pests

9.	Meenu Verma	Department of Zoology, Punjab Agricultural University, Ludhiana, Punjab	Green solutions for rodent pest control: Unveiling the synergistic rodenticidal and reproductive management potential of neem and andrographolide base bait
10.	Naman Sharma	Homoeopathic Medical College and Hospital, Chandigarh	Awareness is the greatest agent for change: A kap study to assess the awareness regarding breast cancer in females of reproductive age group
11.	Sachin Tayal	Centre for Nuclear Medicine, Panjab University, Chandigarh; Mahamana Pandit Madan Mohan Malaviya Cancer Centre, Varanasi	Personalised image based dosimetry for optimisation of therapeutic dose: A step forward towards precision medicine
12.	Shubhi Joshi	Department of Biophysics, Panjab University, Chandigarh, India	Peptide nanoformulations: Our armor against healthcare-associated infections
13.	Vivek Sharma	Department of Chemistry, Baba Farid College, Bathinda	Recycling of waste plastic bottle to high grade PET and ecofriendly adhesive (paper glue) 'A dual application approach'
14.	Anuradha Sharma	Department of Zoology, Panjab University, Chandigarh	Balancing hope and caution: Unveiling the dual nature of norethindrone and 17α-ethinylestradiol in cancer research
15.	Anandita	Department of Biotechnology, Panjab University, Chandigarh	Rapid visual detection of Acinetobacter baumannii and blaoxa-23 gene using functionalised gold nanoparticles
16.	Gursimran Kaur	Post Graduate Institute of Medical Education and Research, Chandigarh	Unlocking hope: Targeted therapy for cobalamin C defect - A beacon of light for rare genetic disorders
17.	Prakash Y Khandave	Department of Biotechnology, National Institute of	Development of human paraoxonase as an antidote

		Pharmaceutical Education and Research, S.A.S Nagar, Punjab-160062, India	for organophosphate-poisoning
18.	Sandeep	Department of Biotechnology, National Institute of Pharmaceutical Education and Research, S.A.S Nagar, Punjab- 160062, India	Engineering antibodies for clinical use: Developing BiSpekDab^{TM} for inflammatory bowel disease treatment
19.	Ranjana Bhandari	UIPS, Panjab University, Chandigarh	Kiddie Chewww…..TM : A journey from idea to reality
20.	Pooja	Central Scientific Instruments Organization, Chandigarh	Utilization of MoSe2 decorated Fe2O3 photoelectrode for multifunctional wastewater treatment and hydrogen generation
21.	Bhupinder Kaur	GHG Khalsa College of Pharmacy	Snow mountain garlic – An extraordinary superfood from the heights of the Himalayas
22.	Tamanna Dua	Department of Chemistry, PEC, Chandigarh	A strategy to win over the bacteria
23.	Yashu Sharma	Department of Pediatrics, Post Graduate Institute of Medical Education and Research, Chandigarh	Unveiling the enigma of leukodystrophies: The quest for hope in rare neurological disorders
24.	Sakeel Ahmed	Department of Pharmacology and Toxicology, NIPER, Mohali	Development of ApoEFrag^{TM} for stroke treatment
25.	Yenisetti Rajendra Prasad	Department of Biotechnology, National Institute of Pharmaceutical Education and Research (NIPER), Sector 67, S.A.S Nagar, Punjab	Enhancing liver cancer treatment: A novel combination regimen with LBURGINAZE^{TM}
26.	Monaal	Department of Zoology, Panjab University, Chandigarh	The mystery of acoustic silence in cave crickets and their survival
27.	Sweety Mehra	Cell and Molecular Biology Lab, Department of Zoology, Panjab University, Chandigarh	Rohan Whispers: Breaking the boundaries in autism research
28.	Shailika Sharma	Life Science Department, Chandigarh University, Punjab	Saving the distinct taste of Kangra Tea in a tiny frozen space

SS1. DYNAMICS LANDSCAPE OF CSSA RNA THERMOMETER FROM NEISSERIA MENINGITIDIS VIA INTEGRATIVE APPROACHES

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ABSTRACT

RNA thermometers (RNATs) are the non-coding RNAs located at the 5' untranslated region (UTR) of the mRNA. RNATs respond to temperature variations in the environment and regulate the production of various heat shock, cold shock and virulence proteins. RNA thermometers undergo structural transitions that bring about changes in the secondary structures, followed by their exposure and occlusion to the ribosome binding site (RBS) at higher (37°C) and lower temperatures (<37°C) respectively, thus controlling the synthesis of corresponding proteins. This is a crucial component of the protective strategy adopted by pathogens to evade the host immune responses. RNATs have been discovered in pathogens like *Neisseria meningitidis* (CssA), *Salmonella enterica* (fourU thermometer), *Yersinia pseudotuberculosis* (lcrF) etc. associated with a variety of diseases in humans. We report an integrative approach for the dynamics study of the CssA RNAT from *Neisseria meningitidis* using Nuclear Magnetic Resonance (NMR) spectroscopy and molecular dynamics (MD) simulation. The *cssA* operon is responsible for capsule production by the pathogen at a temperature of 37°C or higher; while lower temperatures (<37°C) inhibit capsule production. The three-dimensional structure of the CssA RNAT has been previously reported with the help of NMR. The study of dynamics at varying temperatures is crucial for understanding how the RNAT undergoes such changes and whether it is a gradual or a quick and continuous process. NMR relaxation studies (^{15}N and ^{13}C) at various temperatures and MD simulations are on-going and this will shed light on variable time-scale motions of individual nucleotides. The insights thus obtained will be used to derive the relation between structure, dynamics and activity, crucial for the development of inhibitors against this RNA thermometer which plays an important role in bacterial pathogenesis. Similar approach can then be used for targeting RNA thermometers reported from other pathogenic bacteria.

SS2. ENERGIZING TOMORROW: UNVEILING TRIBOELECTRIC NANOGENERATORS' POTENTIAL

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ABSTARCT

The convergence of artificial intelligence, wearable electronics, and the Internet of Things marks a significant advancement with transformative potential. However, a critical hurdle

must be overcome to fully exploit these technologies: establishing a reliable and sustainable power source for wearable and implantable electronic devices like digital watches, pulse sensors, and cardiac pacemakers. While lithium-ion batteries, due to their high energy density, are commonly used, challenges persist regarding their lifespan influenced by factors such as chemical composition, aging, and charging specifics. Ensuring enduring power sources is essential for sustained device operation. Wearable devices face the challenge of enhancing battery lifespan without size escalation, while implantable medical devices require continuous power to avoid additional surgeries for battery replacement. Effectively addressing these power-related issues is pivotal for unleashing the complete potential of these innovations. Triboelectric nanogenerators (TENGs) present a promising solution to the power challenges posed by conventional lithium-ion batteries for electronic devices. Operating through the combination of the triboelectric effect and electrostatic induction, TENGs leverage friction-induced contact to generate electric charges. This power generation stems from induced electrostatic charges on the surfaces of distinct materials with differing electronegativities, prompting electron flow between the electrodes. In response to these challenges, a TENG was developed using MWCNT-PDMS, Aluminum and Copper to offer a solution. The prototype's efficacy was tested across various applications: Digital Wrist Watch, Self-Powered sensing, Self-Powered Electronic Devices, Implantable Cardiac Pacemaker, and Smart Glove for Rehabilitation Monitoring. The implementation of Triboelectric Nanogenerators (TENGs) holds significant societal implications.By offering a sustainable alternative to conventional lithium-ion batteries, TENGs can reduce electronic waste and reliance on finite resources. Their ability to harness biomechanical energy for powering bio-electronic devices and sensors promises improved healthcare solutions and enhanced patient monitoring. Additionally, TENGs' potential to power wearables and implantable devices can enhance convenience and quality of life. This technology's broad applicability, reduced environmental impact, and advancements in healthcare underscore its positive influence on sustainability, health monitoring, and technological innovation, ultimately benefitting society at large.

SS3. GREEN PRODUCTION OF CLEAN FERTILIZERS: A WIN-WIN SITUATION FOR SCIENTISTS AND FARMERS

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ABSTRACT

Big cities with high-rise buildings look sophisticated. But the serenity of rural life, fresh air, smell of wet mud after rain and extensive greenery have always fascinated me so much that I have always felt an utmost pleasure to visit my ancestral home in the outskirts of Kolkata. I could feel a vast difference between township and village life whenever I visited the villages. In cities, people live a life of comfort, everything within their reach and ready-made. They take in so much from nature and, in turn, give back polluted air (too much carbon dioxide, sulfur dioxide, nitrous oxide) from their sophisticated cars, cut down trees for their edifice (again carbon dioxide imbalance); so, a disparity is so inevitable. Whereas, in villages, people grow trees for their living, they earn their livelihood by taking care of nature. This sowed the seed in

our mind, “Is it possible to make use of an earth-abundant commodity to do some good to the environment and the villagers?” Fertilizers are regarded as “friends-to-farmers” as these determine their earning and livelihood. The significant components are nitrogen, phosphorous and potassium; the nitrogenis obtained in the form of ammonia and its derivatives. But how to meet the large-scale demands of ammonia? Till date, the only reliability is the industrial Haber Bosch process but on the one hand it produces ammonia and on the other hand it causes a detrimental effect on the environment by emitting 3% of the world’s total CO_2 emission. So, it requires ~~a~~ serious thinking “is it really worthy relying on this process at the current world scenario when a net- zero sustainable society is utmost desired?” This led us to an alternative approach, where grid power is used to draw electricity andthe applied voltage breaks the earth abundant N_2 gas to produce the value-added product ammonia. This electrical-to-chemical conversion is regarded as an electrochemical nitrogen reduction reaction that requires a medium that helps to capture and solvate the gaseous N_2 anda catalyst that breaks the chemically inert N≡N. So, in our laboratory, we have designed an electrolyzer for this operation and developed an aqueous system capable of capturing N_2 far better than the conventional electrolytes used. Also, we designed suitable catalysts and after a toilsome four years, we have been able to reach to the industrial scale periphery of an energy-efficient conversion of electricity(N_2)-to-ammonia. The broader vision is that this method being carbon-neutral will help the society to move a step ahead towards “net-zero” with a simultaneous production of green ammonia. Thisproduct will not only serve the villagers for crop production in an eco-friendly manner but alsoserve as a green hydrogen store and flourish as a future fuel for running the electric vehicles. This electrified technology will give off only water as a by-product and this way we can put abar on the net CO_2 emission and save our society.

SS4. ENGINEERED BIOCOMPATIBLE DUAL-CHARGE METALLOCATANIONIC VESICLES ENCAPSULATING PHOTOSENSITIZER FORMULATIONS FOR EFFICIENT PHOTODYNAMIC THERAPY

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ABSTRACT

Photodynamic therapy (PDT) is a clinically approved non-invasive therapeutic technique used for the treatment of various types of cancers and bacterial infections. PDT has three main components, a photosensitizers (PS), light source, and molecular oxygen. These components act simultaneously where PS is activated by the light at a specific wavelength to optimally excite their triplet state, which results in the generation of cytotoxic reactive oxygen species (ROS) through energy transfer from PS to molecular oxygen to trigger oxidative stress-induced cell death. However, the full potential of PDT has yet to be realized by the limitations of conventional PS such as poor water solubility, photobleaching, and self-aggregation.

Further, the conventional clinical application of PDT is limited by the low skin penetration of visible light. Therefore, it is imperative to address these limitations of the conventional PDT through the development of next-generation of PDT. With an objective to improve the PS delivery and photophysical properties for effective PDT, a new class of nano-colloids called metallocatanionic vesicles (MCVs) have been fabricated. These MCVs are water solubilized formulations that can be synthesized by an easy, fast, and in-expensive solution- solution mixing method. Pure MCVs act as an excellent antibacterial agent against Gram-positive and Gram-negative bacteria. These MCVs were fabricated by utilizing Fe and Cu metal-based single and double-chain cationic metallosurfactants (i.e. FeCPC I, CuCPC I, FeCPC II, and CuCPC II) in combination with an anionic surfactant (Na Ol or AOT). These MCVs showed low critical aggregation concentration with excellent stability and also their size, surface charge, and shape can also be controlled by changing metallosurfactant/anionic surfactant ratio. These biocompatible MCVs were capable of enhancement of PS Singlet oxygen (1O2) generation ability irrespective of the charge present on the PS both cationic and anionic. Overall, this research further concluded that the presence of metal ion in MCVs help in the enhancement of PS 1O2 generation ability and also enhanced the PDT efficacy against cancer cells (MCF-7 and U-251 cells) and bacteria (*S. aureus* and *E. coli*). The presence of positive and negative charges on these MCVs increases the future research opportunities for these formulations in different photosensitizer (hydrophilic and hydrophobic) delivery systems and further use in photomedicine. A sterilization chamber can be fabricated whereby spraying this formulation on our daily use items such as (keys, mobiles, headphones, laptops, etc.) and irradiation of visible light (5 to 10 min), which can completely irradicate the microorganisms. This technology can be used as a disinfectant and sterilization of medical and surgical instruments. It will replace the available harmful UV light-based technology and other disinfectant used in the market. This will provide an alternative approach to combat bacterial infection without creating resistance with improved therapy as compared to available antibiotics and disinfectants spray such as Lysol, Dettol spray, Savlon spray, etc. These formulations can also be used for cleaning and disinfect of fungi and viruses from the surface. These metallocatanionic vesicles have lots of potential and it can be explored for many other applications such as delivery vehicle for various drugs, wetting agent, etc.

SS5. ELECTROMAGNETIC POLLUTION: A NEW CHALLENGE FOR THE WORLD

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ABSTRACT

We live in a digital world, a world of electronic gadgets and artificial intelligence. Electricity, mobile phones, laptops, Wi-Fi, smart watches and other such electronic gadgets are basic necessities of life today. According to a report by World Economic Forum dated Oct 27, 2022, there are approximately 8.6 billion active mobile subscriptions worldwide. There is no denying the fact that the lifeline of this digital world is electromagnetic radiation. Pollution caused by electric and magnetic fields generated by power lines, electrical equipment, mobile and cordless phones, radar, electrical household appliances, microwave ovens, radios,

computers, electric clocks, and the like is known as electromagnetic pollution or electrosmog. There might be no instant observable effect of this pollution but studies suggest that long term exposure to these will account for major transpositions in future. The objective here is to discuss the evidence pertaining to the possibility that long-term exposure to EMR may be associated with health risks. An extensive survey of literature on EMR suggests that it affects fertility, various body tissues including brain, kidney, liver, pancreas, causes tinnitus, painful fingers, sleeplessness, addiction, behavioral changes, oxidative stress, optical, dental and osteal damage, has impact on haematology, causes antibiotic resistance and even speech problems in children. EMR is responsible for harmful prenatal effects and is even reported to be carcinogenic. It not only affects humans but also hampers plant growth, causes mortality of chick embryos, disorientation and navigational problems in birds, reduces milk yield in cows and disturbs colony life in honey bees. It is general belief among many researchers that EMR being non-ionizing in nature (NIR) is too weak to cause any biological effect, however a few studies report otherwise. While ionizing radiations directly damages DNA, NIR interferes with the oxidative repair mechanisms resulting in oxidative stress. Therefore, it is suggested that electromagnetic pollution is posing a colossal threat to our entire ecosystem and this calls for an immediate exigency to conduct more research in the area of EMR, its health impacts and the mechanisms behind them so as to assess the present situation and take precautionary measures for sustainable development. All this being said, something which is in our hands is to reduce our exposure to EMR at personal level by limiting the usage of electromagnetic gadgets and not letting technology overpower the most expensive asset of our body i.e. our health.

SS6. INNOVATIVE MINDS, RESILIENT COMPANIES, STRONGER COMMUNITIES: THE SOCIETAL SIGNIFICANCE OF INTELLECTUAL CAPITAL, GOVERNANCE AND FAMILY ON BUSINESS PERFORMANCE

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ABSTRACT

In this era of rapid technological developments and shifting economic landscapes, the intricate interplay between businesses and society has become more evident than ever before. At the core of this dynamic relationship lies the concept of intellectual capital-an intangible asset encompassing human capital, structural capital and relational capital. Due to the increasing complexity in the business environment bringing in complex challenges for businesses, the significance of understanding how intellectual capital interacts with corporate governance, family influences, and subsequently impacts the financial well-being of companies cannot be overstated. The objectives of this research endeavour were: firstly, to delve into the multifaceted relationships between intellectual capital, corporate governance, and family factors, and secondly, to illuminate the broader implications of these dynamics on the general public and society at large. The research aims to shed light on how businesses can strategically harness intellectual capital, optimize corporate governance practices, and take advantage of

familial influences to enhance their performance and positively contribute to the well-being of the community and society at large. Throwing light upon the intricate mechanisms connecting businesses and society, the research aims to shape a future where prosperity is not only measured in financial terms but also the sustainable growth and well-being of all stakeholders. The research has been undertaken by undergoing a content analysis of annual reports of top 500 BSE-listed companies to understand how these top companies are disclosing intellectual capital in their reports. Further using the secondary sources, data was collected for corporate governance variables, family variables and the financial performance of these listed companies. Finally using the panel data analysis technique, the relationships have been analysed to throw light upon the implications for the public and society as a whole. The above research would be beneficial for the public and would hold potential outcomes for society. The results would encourage companies to adopt better governance practices contributing to transparent disclosure practices, greater accountability and responsible management leading to informed and better decision-making by investors and other stakeholders. Guiding the family-owned businesses, the results would help to ensure longevity and success across generations boosting economic development. The results relating to the factors influencing the intellectual capital would incentivize companies to invest in research, development, and innovation; thus, helping them to focus on strategies for sustainable financial success which will contribute to economic growth and competitiveness. Further, the results could be used by policymakers to develop regulations and policies that encourage companies to prioritize intellectual capital development, ultimately driving economic growth. Finally, the research could be used to educate and create awareness among academicians and professionals driving them to think about wealth beyond numbers. Thus, overall the research holds the potential to create a ripple effect across the business landscape by promoting responsible practices, informed decision-making, and sustainable growth, ultimately contributing to the welfare of the society as a whole.

SS7. PATIENTS UNDERSTANDING OF MEDICAL PRESCRIPTION INSTRUCTIONS (PUMPI): A CRITICAL TOUCH POINT FOR OPTIMIZING THERAPEUTIC OUTCOMES IN RURAL COMMUNITIES

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ABSTRACT

There is scarcity of evidence in existing literature about patient's understanding of instructions given in medical prescriptions by treating doctor particularly in community setting. The present study was prompted by our experience where many patients take medicines in either suboptimal or erroneous manner leading to therapeutic failure. Health facilities in the community setting of low middle income countries are typically burdened with huge patient

load, due to this heavy amount of patient rush, medical care providers have very less time to explain each and every step of medication thoroughly to patients and they often hurry through their prescription instructions to the patients. Latter sometimes find it difficult to comprehend all the instructions in short span of their encounter with treating doctor. The failure to clearly understand the instructions can easily lead to poor compliance and sub optimal benefits of medication, so this study was done to evaluate the proper data regarding the patients understanding of medication. A total of 19 patient reporting to OPD were evaluated by medical practitioners at RHTC and medication were prescribed to enrolled patient for free of cost. Patients were clearly explained about the dose, frequency and duration of intake of those medication. Subsequently, each patient was requested to report to research team of interns who assessed patients recall within 15 minutes of prescription writing using a structured questionnaire. Written consent of patient was also taken. Immediate recall for first prescribed medicine was 78.5% for dose, 73.7% for frequency and 89.5% for total prescribed duration which was substantially higher than reported in literature. The odds of having suboptimal immediate recall of prescribed medicine (in terms of dose, frequency or duration) were increased by nearly 2 times in patients aged 40 years or less in comparison to patients aged above 40. There was also a socioeconomic differential with patients from lower SES having nearly 4.7 times higher odds of suboptimal recall as compared to patients from middle SES. Less educated patients also showed higher odds of having poor recall as compared to better educated patients (OR 5.21, 95% CI 0.23-116.2). Limitations of our study include its small sample size, failure to standardize instruction strategy (written, oral or pictorial) and we did not test the long-term recall (i.e., how long does recall last?). Strengths of study include information was provided in local native language and evaluation of recollection was done by independent observers. Assessment of immediate recall of medical instructions by patients attending OPD in busy clinical setting can be useful strategy to ensure proper adherence to prescribed treatment with better therapeutic outcomes. By evaluating these basic steps of medical healthcare, we can ensure the proper guided and desired treatment to the patient. Further in future studies large sample size, standardized instruction framework and diverse populations are required for better generalizability of current study findings.

SS8. REPELLENT BASED FORMULATION: A BOON FOR FARMERS AGAINST MAMMALIAN PESTS

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ABSTRACT

Repellent based formulation (RBF) was developed using essential oils in synergism to deter mammalian pests from entering and damaging crop fields and commensal situations without causing harm to the animals and ecosystem. Mammalian pests including rodents and higher mammalian pests like, Nilgai, wild boar, monkeys, elephants etc. are the familiar commensal and agricultural pests in India. Generally, chemical based rodenticides are used for rodent pest management, which are not eco-friendly. Higher vertebrate pests cannot be killed as are protected under Wildlife Protection Act (1972). Therefore, for the management of these pests, preventive methods like guarding, fencing, repellents (visual, acoustic and chemicals) are

used. Many of these management methods like fencing and bioaccoustic equipments are not cost effective, therefore are not readily adopted by farmers. Animals also develop habituation against different repellents. Therefore, there was a need to develop a safe and cost effective management method to prevent damage caused by these animals for long duration. Keeping this in mind, a repellent based formulation (RBF) was developed in our laboratory using essential oils in synergism. It was tested against house rats under simulated conditions and was found to be quite effective. For effective field application and to slow down the release of volatiles from this formulation for increasing its efficacy, RBF was adsorbed on various natural adsorbents like maize cob, wheat husk and wood dust. These formulations were then tested under simulated field conditions against house rats. Out of various adsorbents, wood dust was found to be most effective, preventing rodent damage for upto 30 days. RBF was prepared by mixing oils like methylanthranilate, eucalyptus oil, citronella oil, pongomia oil & kerosene oil with tween 80 on magnetic stirrer. It was then adsorbed on wood dust (350 to 500ml/kg wood dust) to slow down the release of volatiles. Formulation prepared was then packed in muslin cloth or parchment paper (10-25g) for its field application. It was tested for its efficacy against rodent pests in simulated storage conditions in Animal house and Experimental rattery, PAU, Ludhiana, grain stores at village Sherpur, Jagraon, ESIC Model hospital, Ludhiana, Girls Hostel, PAU, Ludhiana, Circuit House, Ludhiana, beseem and bajra crop fields at village Noorpurbet, Bagha khurdh and Khaira bet, Ludhiana. It was also tested for its efficacy against Nilgai (Blue bull) in maize crop fields at Ladhowal seed farm PAU, Ludhiana, Wheat crop fields, village Noorpurbet, Ludhiana. It was also validated for its efficacy against nilgai by farmers themselves in Moong crop fields at village Rasoolpur, Ludhiana, in vegetables and maize crop fields, village Mallah, Ludhiana, and in an orchard at village Dhamot Kalan, Ludhiana. For rodent pests, pouches were kept at hiding places in commensal situations and for crop fields, either burrows were fumigated with RBF or pouches were tied on bamboo sticks outside the burrows. For nilgai, pouches were either tied on crop stems or on rope fencing around crop fields at a height of about 4 feet @ 20 pouches/acre. RBF provided 50-90% reduction in rodent activity for 24-54 days. Similarly, for Nilgai, it provided 80-100% protection for 21-45 days. Animals didn't develop habituation against RBF. This novel RBF is farmer's friendly (being cost effective, easy to apply) as well as eco-friendly. It can become a sole humane preventive method against rodents and higher mammalian pests (Nilgai). Some farmers are already using it against blue bull damage. Its recommendation and commercialization for mammalian pest management in near future can provide relief to farmers against these pests.

SS9. GREEN SOLUTIONS FOR RODENT PEST CONTROL: UNVEILING THE SYNERGISTIC RODENTICIDAL AND REPRODUCTIVE MANAGEMENT POTENTIAL OF NEEM AND ANDROGRAPHOLIDE BASE BAIT

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ABSTRACT

To develop an eco-friendly palatable, stable and bioavailable neem and andrographolide-based bait with rodenticidal and antifertility properties for instant and long term management of rodent pests. Rodents are the mammalian pests causing damages and spreading diseases. The most common management method for these pests is the use of chemical rodenticides in crop fields, and trapping under commensal situations. Rodents rebuild their population in a very short duration after the application of these management methods, because of the increase in the reproductive potential of the residual population. Neem seed extract and a bioactive compound, andrographolide extracted from *Andrographis paniculata* are well known to have toxic and antifertility properties. Both are too bitter and for field application against rodent pests, there was a need to formulate a palatable bait using these extracts. There was also a need to address the problem associated with bioavailability and stability of secondary metabolites of these extracts. Studies conducted in our laboratory revealed that oral doses of both neem seed extract and andrographolide have toxic and antifertility effects. However, when fed individually as baits to rats, mortality was nil and antifertility effect was not as pronounced as with oral doses, which might be due to the less bioavailability of secondary metabolites in bait. Keeping this in mind, a palatable, stable and bioavailable bait was formulated using both andrographolide and neem seed extract in synergism to effectively use their toxic and antifertility properties for instant and long term management of rodent pests. Neem seed powder was prepared using a biostabilizer (UV protector, antioxidant and polymerization inhibitor). To extract both polar and non-polar compounds, neem seed alcoholic hexane (NSAH) extract was prepared. Andographolide powder was dissolved in warm ethanol. Both were slowly adsorbed on a polymer (an inert, non-poisonous, deep pored polymer with stable matrix to mask the taste and to increase the bioavailability), coated with sugar syrup and mixed with maize flour to prepare the bait. This novel neem seed and andrographolide (NSA) based bait was fed to house rats for 15 days in bi-choice conditions in laboratory as well as in field conditions. Consumption, toxic, antifertility effects against both sexes were recorded. For antifertility effect and its reversibility, duration of estrous cycle, sperm parameters, histo-morphology of testes and ovaries, breeding potential, level of various sex hormones were recorded. NSA bait was found to have both toxic and irreversible (targeted stem cells and primordial follicles) antifertility effects against both sexes of rats under both laboratory and field conditions. It can be an eco-friendly, cost effective and plant based approach for management of rodents to counterbalance the limitations associated with chemical rodenticide. It can be used in crop fields, grain stores, grocery shops, houses, railway stations and poultry farms etc. for the safe, instant and long term management of rodents. Plant based baits with both toxic and antifertility properties are not available commercially.

SS10. AWARENESS IS THE GREATEST AGENT FOR CHANGE: A KAP STUDY TO ASSESS THE AWARENESS REGARDING BREAST CANCER IN FEMALES OF REPRODUCTIVE AGE GROUP

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ABSTRACT

Awareness is essential for prevention, early detection, targeted therapy and is key to ensuring effective treatment. Being aware of a disease and its symptoms means people are more likely to take preventative action, and go for screenings, tests and check-ups. A lack of awareness of diseases or knowledge of options for screening and treatment is a serious barrier to good health. We conducted a KAP study to assess the awareness regarding breast cancer in females of reproductive age group. Non randomised cross-sectional study sampling technique: non random purposive sampling. Study area: females of reproductive age group, study period: July-August 2023, sample size: (n=80). Participants shall be asked to fill a self-made questionnaire after obtaining consent. The data collected shall be statistically analysed using MS excel and SPSS20. By this research we analyse the knowledge, attitude, practice of society towards breast cancer and questionnaire also contains questions regarding breast self-examination which plays major role in spreading awareness in society. Awareness is essential for prevention, early detection preventative action, and go for screenings, tests and check-ups. Breast self-examination plays a major role in early detection and intervention of ca breast Ideally done once a month just after the menstruation, as during this time breasts are less engorged. In postmenopausal age group done at monthly regular intervals. Remind the patient that 90% of breast lumps are not cancer. Better way is in lying down position with arm raised with a mattress support behind Palpation should be using the fingers over all quadrants of the breast. American Cancer Socitey recommends monthly base after 20 years of age Nursing mother should perform bse just after feeding the baby.

SS11. PERSONALISED IMAGE BASED DOSIMETRY FOR OPTIMISATION OF THERAPEUTIC DOSE: A STEP FORWARD TOWARDS PRECISION MEDICINE.

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ABSTRACT

Nuclear Medicine is a specialised branch involving the use of unsealed sources for diagnosis and treatment of various health conditions. The type of radionuclide used along with its characteristic radiation properties greatly determine the efficiency for therapy and quality of molecular imaging suitable for diagnosis. Radionuclides emitting electromagnetic rays (x rays or gamma rays) are suitable for diagnostic imaging whereas particulate radiation (alpha/beta particles) are useful in the therapy of cancer. Most of the radioisotopes in use are for diagnostic purpose but with the advent in reactor/cyclotron technology, imaging modality and easy

availability of new biomolecules with high binding affinity with radiotracer and disease specific markers have helped moved the field to theranostics approach. In this process, the molecular analog used for low dose imaging study should have biological behaviour identical to the therapeutic agent for accurate estimation of maximum tolerable dose to the tumor/lesion. Surrogate radiotracers of low energy are used in imaging which reflect the bio distribution of therapeutic radiotracer. The study requires proper selection of patients, especially with thyroid or prostate cancers as the required radiotracer for diagnosis and therapy are easily available in India. The study requires initial acquisition of a low dose imaging study under a SPECT-CT or PET-CT with patient lying in supine position. Quality control of the prepared radiotracer to be done under ITLC (instant thin layer chromatography) before injecting. Acquisition of multiple time points whole body planar images along with one SPECT-CT of four bed length (approx. 160cms), post10 min injection or multiple 3 D images under PET-CT, to help calculate the retention at lesion areas and percentage washout of radiotracer form the remaining body. Various dosimetry analysis software are available in market of which OLINDA is the most common software used. This software can be used to have a quantitative evaluation of the percentage hold up of activity at lesion/cancerous cells and give a near accurate estimation of therapeutic dose delivery to kill cancerous cells. Dosimetry based on planar imaging has few shortcomings due to overlapped regions, however, in case of hybrid and 3 D better delineation can be achieved. Planar imaging dosimetry is simple in evaluation but leads to overestimation of the estimated absorbed dose however, hybrid/3 D images being though time consuming for patient and evaluator, gives a more accurate approach for therapy planning and help avoid under dose delivery. In comparison to a systemic therapy like chemotherapy, the advantage of targeted radionuclidic therapy is to perform a pre-treatment imaging study for patient specific treatment with the help of dosimetry tool. It shall help in delivering maximum tolerable activity to identified tumor sites rather than a generalised approach. This shall lead in giving better outcome while avoiding irradiation of healthy organs, secondly with the help of personalised therapy we can overcome the large difference in between individual patient response which is observed in one size fits all approach.

SS12. PEPTIDE NANOFORMULATIONS: OUR ARMOR AGAINST HEALTHCARE-ASSOCIATED INFECTIONS

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ABSTRACT

Healthcare-associated infections are acquired during the process of receiving treatment for another illness from a health care facility. These infections are not present during the time of admission however symptoms first appear withing 48 hours after hospitalization or within 30 days after discharge. Individuals undergoing surgery, organ transplant, admitted to intensive care units, burn units, and the elderly population with co-morbidities are the most vulnerable. Additionally, medical staff working in such units are also susceptible to occupational illness.

Healthcare associated infections result in morbidity, prolonged hospitalization and even mortality thereby to reduce the incidences of such infections it is important to determine the areas that act as reservoirs of infection transmission, ensure proper waste disposal and maintain hygienic conditions by following regular disinfection routine. Surfaces that come in direct contact with the infected individuals, doorknobs, medical devices, dressings, etc. act as infection transmission areas. The current treatment protocol entails the application of disinfectants and antimicrobial agents. However, increased incidence of antibiotic-resistance in microorganisms necessitates development of novel antimicrobial strategies. Among the different anti-infective agents, antimicrobial peptides have drawn attention due to properties such as small size, ease of functionalization, biodegradability and low propensity to develop resistance. To enhance applicability, antimicrobial peptides were covalently conjugated with graphene-based nanomaterials by cross-linkers. Since controlling and managing pathogenic infections at healthcare facility was the purpose behind this work, the nanoformulations were explored for their ability to function as an anti-bacterial additive for commercial paint production (Indian Patent Office, Application No. 202211011934 A), anti-pseudomonal bandage and as an anti-bacterial coating on indwelling catheters. These applications were identified based on the magnitude of the peril they pose to mankind, which demands an urgency for developing novel solutions to these problems. By conducting extensive in-vitro as well as in-vivo studies, efficacy of the peptide nanoformulations as sustainable, cost effective and scalable anti-infective agents was established. The current state of antibiotic resistance is a cause of concern as we are on the verge of entering into the post-antibiotic era, during which pathogenic infections will be the leading cause of mortality. It is believed that prevention is the key to preventing healthcare-associated infections. Under the "National Action Plan on Antimicrobial Resistance", India is continually working towards implementation of measures and development of state-of-the-art technologies to effectively manage the occurrence and spread of drug resistant infections in healthcare settings. Peptide nanoformulations provide sustainable, facile, cost-effective and indigenous alternatives to current anti-infective therapies. We believe that in the ongoing battle against healthcare-associated infections, peptide nanoformulations shall act as our armor.

SS13. RECYCLING OF WASTE PLASTIC BOTTLE TO HIGH GRADE PET AND ECOFRIENDLY ADHESIVE (PAPER GLUE) 'A DUAL APPLICATION APPROACH'

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ABSTRACT

This project is focused to develop novel technology for replacing hazardous or toxic methods of recycling of waste PET bottles by eco-friendly green method. Recycling of waste PET into high grade PET by using suitable catalyst and solvent which can be easily recyclable. It would be expected long term sustainable benefits for environmental safety. Most of the reported methods of recycling of waste PET gave poor yields, long reaction time, harsh reaction conditions, expensive, toxic to various extents and non-recyclable catalyst. Replacement of conventional systems by using green method for the recycling of waste plastic bottle into food

grade PET which is environment friendly, cheap, easily recyclable solvent and catalyst and various applications of MHT and PET is the key feature of the idea. Obtained PET (Polyethylene terephthalate) has been characterized by LC-MS, DSC and TGA. Obtained Monohydroxyethyl terephthalate (MHT) formed has been characterized by GC-MS, ^{1}H-NMR, ^{13}C –NMR, GC-MS shows that the purity of synthesized MHT was 99 %.

SS14. BALANCING HOPE AND CAUTION: UNVEILING THE DUAL NATURE OF NORETHINDRONE AND 17A-ETHINYLESTRADIOL IN CANCER RESEARCH

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ABSTRACT

In the complex world of cancer research, the quest for groundbreaking therapies can be quite a rollercoaster ride, presenting unexpected breakthroughs and valuable lessons. Dr. Indu Sharma, accompanied by her Ph.D. student, Anuradha Sharma, set out on an exciting journey to tackle the challenges posed by epithelial ovarian cancer. Ovarian cancer had long been a perplexing mystery, a formidable foe that left even the most experienced researchers scratching their heads and leaving women facing an uncertain future. With limited treatment options and a pressing need for fresh ideas, the concept of repurposing drugs emerged as a glimmer of hope. From the vast pharmaceutical realm, emerged two heroes: Norethindrone (NET) and 17α- ethinylestradiol (EE2), both found in oral contraceptives. Their unique hormonal properties piqued interest, especially in their potential impact on cancer cells. The burning question arose: Could these unexplored steroids hold untapped potential for ovarian cancer management? The research journey began with in vitro tests on SKOV3 ovarian cancer cells, examining NET and EE2 individually and in combination. The outcomes were nothing short of astounding. When assessed individually, these compounds exhibited strong anticancer properties like inducing apoptosis, suppressing migration, and boosting key tumor suppressor genes TP53 and PTEN, while causing cell cycle arrest at G2/M phase. The combination of NET and EE2 exhibited even more promising results against cancer cell growth. To further explore the in vivo potential of these compounds, the researchers turned to zebrafish models, where an unexpected twist in the narrative unfolded. Within the zebrafish, exposure to NET and EE2 separately at various intervals - 10, 20, and 30 days- unveiled an alarming phenomenon. These compounds modulated the endocrine system, disturbing the delicate hormonal equilibrium within the fish. Gender-specific effects were seen with females experiencing a delayed oocyte maturation that interfered with their reproductive rhythm, while males exhibited an unusual acceleration in spermatogenesis after exposure to 1000 ng/L of NET. Additionally, exposure to 100 ng/L of EE2 had a dual impact, impairing both oogenesis and spermatogenesis while moderately impacting survival. Curiously, when NET and EE2 were administered in combination (1000 ng/L NET + 100 ng/L EE2), the endocrine modulation was less pronounced. This raised intriguing questions about the interactions between these compounds and their influence on the endocrine system, suggesting a potential positive aspect. As this scientific narrative unfolds, it presents a dual storyline - one of hope in the area of ovarian cancer management and another of caution regarding endocrine

modulation in zebrafish. While the zebrafish experiments raised concerns and hinted at a more nuanced understanding of these compounds, further research aims to harness their benefits while addressing unintended consequences, especially in reproductive health of both human and aquatic life. Overall, the present research on Norethindrone and 17α-Ethinylestradiol promises improved management for women's health in tackling ovarian cancer and hormone-related disorders.

SS15. RAPID VISUAL DETECTION OF *ACINETOBACTER BAUMANNII* AND BLAOXA-23 GENE USING FUNCTIONALISED GOLD NANOPARTICLES

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ABSTRACT

Acinetobacter baumannii is an opportunistic nosocomial pathogen that represents a major challenge in ICUs because of resistance to most antibiotics including the carbapenems. Outbreaks in ICUs by MDR strains of *A. baumannii* and secondary infections in COVID-19 patients have been associated with high mortality. β-Lactamases that hydrolyse carbapenems are referred to as OXA-type carbapenemases. The blaoxa-23 gene is one of the most prevalent β- lactamase genes in carbapenem-resistant *A. baumannii*. The turnaround time (TAT) for identification of *A. baumannii* and detection of blaoxa-23 using conventional diagnostic methods is 24–48 h. There is an urgent need for a rapid Point-of-Care diagnostic method, to detect *A. baumannii* and the strains harbouring blaoxa-23 gene, which will offer referential information for early and effective treatment. We report here a Gold Nanoparticles-oligonucleotide based biosensor for rapid, visual detection of *A. baumannii* and blaoxa-23 gene, in clinical samples like tracheal aspirations, bronchial lavage and sputum, without going through the process of genomic DNA extraction. The biosensor is sensitive(0.5ng/µl), specific and gives results in 40 minutes without any complex techniques or expensive equipments. To the best of our knowledge there is no report on Point-of-Care method for the detection of *A. baumannii* and blaoxa-23 gene, based on gold nanoparticles directly from clinical samples. The aim is to better manage the infection, containment of hospital outbreaks and its dissemination to the environment. Early detection of blaoxa-23 gene will also enable judicious use of antibiotics to reduce the undue exposure to oral and gut microbiota.

SS16. UNLOCKING HOPE: TARGETED THERAPY FOR COBALAMIN C DEFECT - A BEACON OF LIGHT FOR RARE GENETIC DISORDERS

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ABSTRACT

Gursimran Kaur, joined as a PhD student in Post Graduate Institute of Medical Education and Research, Chandigarh. Her supervisor was working in the area of rare biochemical metabolic

disorders in pediatric population. Upon finding from previous work in her lab, there was set of patients having cobalamin C defect, a rare inborn error of cobalamin metabolism. This disorder presented itself in children in the form of both neurological and biochemical manifestations. Visual impairment, developmental delay was most common among them. Two classical phenotypes were there. Early onset phenotype has higher mortality rate as they are not even able to be diagnosed. Late onset children present symptoms in later stages of life. She had an insatiable curiosity and a heart filled with compassion for those suffering from cobalamin C defect. She planned her research work related to therapy for cobalamin C defect. As lifelong therapy is needed, the treatment is expensive, still not effective and families bore the brunt of the financial burden. In their prelim story, they found a peculiar mutation that was prevalent among the North Indian population. When they came to know that this mutation occurred at a critical location where it cleverly escaped the mechanisms of premature translation termination. Gursimran and her mentor soon realized the potential of this revelation. They studied that such a particular mutation could potentially be targeted using a specific set of drugs already being used to combat other genetic disorders like Duchenne muscular dystrophy, cystic fibrosis. This was a glimmer of hope in a world clouded by uncertainty and despair. These drugs could trick the ribosomal machinery to surpass the premature stop codon and lead to the formation of functional full-length protein. With unwavering determination, they proposed a comprehensive study. Their aim was clear: to correct these mutations through meticulous in vitro experiments. They would test the efficacy of the drugs in cell lines and, if successful, validate their findings using primary fibroblasts obtained from patients grappling with the cobalamin C defect. This was a baseline study but it can reach heights from scratch as the potential impact of their research was profound. If successful, this work could alleviate the overwhelming economic burden on the parents of these patients, who had been tirelessly funding their children's treatments. The medicines that are presently prescribed are imported from USA that can cause a hole in the pocket of parents, given that these medications need to be taken throughout one's life. It could also significantly enhance the quality of life for these patients, giving them a chance at a more normal existence. It can be a testament to the power proving that sometimes, in the quiet corners of research institutions, the greatest stories of hope and progress are written.

SS17. DEVELOPMENT OF HUMAN PARAOXONASE AS AN ANTIDOTE FOR ORGANOPHOSPHATE- POISONING

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ABSTRACT

Organophosphates (pesticides and & nerve agents) are dangerous neurotoxins and represent a significant public health risk. Treatments available for OP-poisoning are though somewhat effective but still have significant side effects. Developing novel treatments for OP-poisoning is a top public health concern. Towards this, a promising strategy for developing antidote for OP-poisoning is ‘protein-based bioscavengers’. Compared to existing treatments, these enzymes may be less harmful and more effective. Before OP has a chance to inhibit its

physiological targets, these blood- circulating enzymes can quickly neutralize OP compounds. Human paraoxonase 1 (hPON1), a 40-kDa enzyme, is a promising candidate for the development of an effective and safe antidote for OP-poisoning. However, hPON1 has some challenges, such as low OP-hydrolyzing activity and poor pharmacokinetic properties. We are improving these properties of rhPON1 enzyme using protein engineering approaches. Our results suggest that engineered hPON1 could be a promising new antidote for OP-poisoning.

SS18. ENGINEERING ANTIBODIES FOR CLINICAL USE: DEVELOPING BISPEKDAB™ FOR INFLAMMATORY BOWEL DISEASE TREATMENT

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ABSTRACT

Inflammatory Bowel Disease (UC & CD) is an inflammatory gastrointestinal disorder that afflicts >3.5 million individuals worldwide and >1.5 million in India. Cytokines TNF-α & IL-23 emerged as main drivers for the inflammation in IBD and blocking the interactions of TNF-α and IL-23 with their receptors hold the key to treating IBD. Existing treatments, such as adalimumab (Humira), ustekinumab (Stelara), and infliximab (Remicade), target these cytokines individually. Though effective, these biologics come at a high cost, placing them out of reach for many, especially in developing countries like India. Thus, there is a dire need to develop a more effective and safer biologic for IBD treatment. Towards this, we are developing BiSpekDab™, an engineered antibody that can neutralize both hTNFa and hIL23 simultaneously. BiSpekDab is composed of anti-TNF-α and anti-IL-23 nanobodies fused with a half-life extension partner via strategically designed linkers.

SS19. KIDDIE CHEWWW…..TM : A JOURNEY FROM IDEA TO REALITY

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ABSTRACT

Autism spectrum disorders (ASD) are a class of neurodevelopmental disorders that are manifested mainly in children, with the primary symptoms running the gamut from social/communication deficits and stereotypies (the so-called “core symptoms”) to associated behavioral anomalies like anxiety, depression, and attention-deficit hyperactivity disorder (ADHD). There are no approved drugs for autism yet except Risperidone and Aripiprazole which are approved for treatment of aggression in autistic children and many are under clinical trials. While the pathomechanistic pathways involved in the disorder are not very well

understood as yet, the role of neuro-inflammation and in the same has been suggested. Nevertheless, the triggers giving rise to this neuroinflammation have not previously been explored in detail, so in the present study, we aimed at exploring the role of glutamate on these processes, potentially carried out through increased activity of inflammatory cells like astrocytes, and a decline in neuronal health. We got indication about the role of glutamate cascade being associated in autistic children from pre-clinical studies. Now, the question arose to develop such a therapeutic or delivery product which is patient compliant and children can easily consume along with them getting beneficial effect. So, the search led to the idea about developing such a patient compliant formulation which the autistic children could easily consume. Chewable gel (gummy) would be enjoyed by the autistic children because of its flavour and taste and would result in patient compliance which is a big problem in these children because of behavioural complications such as rigid nature, aggressive behaviour and irritability. Hence, we formulated Kiddie Chewww…. TM, a novel chewable gel containing taurine, an endogenous amino-acid to be used as an add-on therapy for these children. Taurine showed comparable results with receptors such as Nrf2-Keap1, NF-kB, NMDA as compared to the approved drugs in in-silico studies. It also showed efficacy with GPR40, short-chain fatty acid receptor. Hence, might be helpful in mitigating gut-brain dysbiosis and neuroinflammation in autism as well as calcium homeostasis dysregulation, generation of reactive oxygen species (ROS), mitochondrial dysfunction and synaptic plasticity changes. It is also a bio-marker in autism. Kiddie Chewww…. TM is a non-sticky,non-gritty, smooth consistency, soft chew. Currently, available in two flavours mixed-fruit and berry flavour. It's a stable formulation which has been optimized. It specifically containes PEG 4000 and Fructo-oligosaccharide (FOS) which helps in tolerating the gut-dysbiosis in the formulation (Patent-filed- A pharmaceutical formulation, its method of preparation and use thereof" & Trademark filed- KIDDIE Chewww… TM). The value proposition of the developed product is that it is safe, inexpensive platform technology, patient compliance due to its flavor, aesthetic appeal, citrus and fruity taste. There is an option of altering dose strength and dosage regimen. Best Platform technology for pediatric, geriatric and patients with dysphagia. One of its kind for autistic patients and can help in achieving compliance to their regimen. Negligible side-effects profile because all excipients used in formulation are US-FDA approved/GRAS and food-grade as well. Till date no such product has been developed for autistic children.

SS20. UTILIZATION OF MOSE2 DECORATED FE2O3 PHOTOELECTRODE FOR MULTIFUNCTIONAL WASTEWATER TREATMENT AND HYDROGEN GENERATION

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ABSTRACT

To address the growing global energy demand, the world is transitioning to renewable sources, with hydrogen emerging as a clean and sustainable fuel option. While water is abundant, but availability of fresh water is very limited, and alternatively untreated wastewater can also be a source of pollution. Thus, using polluted/low quality water for hydrogen production presents a dual solution: managing wastewater while generating clean fuel. Photoelectrochemical

(PEC) water splitting using photoelectrodes offers a promising approach. In this study, we showcase hydrogen production from dye-contaminated water (utilizing methylene blue as a model pollutant) using a MoSe2-decorated Fe2O3 photoelectrode in a PEC water-splitting system. The photoelectrode is synthesized via hydrothermal route and its characterization confirms optical, structural and morphological properties through UV-Vis spectroscopy, XRD and SEM analysis. The hybrid electrode achieves a maximum photocurrent density of approximately 2.2 mA/cm² at 1.23 V vs RHE. Optimized conditions yield impressive dye degradation efficiency (~97.58%), significantly surpassing MoSe2 and Fe2O3 alone. The electrodes were also studied for real waste water, which resulted in 53.84% removal of TOC and 67.37% removal of COD along with H2 generation. This could be assigned to efficient charge separation in the designed heterostructure. Scavenger tests elucidate degradation mechanisms, highlighting hole-driven dye degradation and electron-mediated hydrogen production. The electrodes were also studies for preliminary microbial decontamination and resulted into complete removal of microbes from sample. Further the hybrid electrode can be scale up to utilize it on large scale to treat industrial waste water and simultaneously energy generation in form of hydrogen gas under direct sunlight.

SS21. SNOW MOUNTAIN GARLIC – AN EXTRAORDINARY SUPERFOOD FROM THE HEIGHTS OF THE HIMALAYAS

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ABSTRACT

Among the wild varieties of Allium species, Snow mountain garlic (SMG) (Allium schoenoprasum L.) is a variant of leek exclusively found in the high elevations (~6000 feet with subzero temperature) of the trans-Himalayas. SMG has been reported to be used as a preventive functional food owing to its medicinal properties and is popular as a therapeutic agent for various ailments in Indian Himalayan and Tibetan traditional medicine systems (Sowa Rigpa). Despite its popularity as Himalayan traditional medicine, minimal scientific literature on SMG highlights its use as a folk remedy for arthritis pain, inflammation, etc. However, the pharmacological claims of SMG have not been validated scientifically. Therefore, the present study aims to investigate the phytochemistry of SMG and pharmacological efficacies compared to commercial/normal garlic (NG). This research focused on screening nutritional and phytoactive secondary metabolite profiles via various standard and state-of-the-art analytical techniques such as HP-TLC, LC-MS-MRM, and GC-MS-Headspace. The anti-candidacidal, antioxidant, anti-arthritic, and anti-inflammatory bioactivities of SMG were investigated by using in-vivo (rats) and in-vitro (Candida sp. and macrophage RAW264.7 cells) experimental models along with pharmacokinetics analysis of principle phytocompound. Translational benefits and future scope SMG showed 5 unique volatile bioactive compounds, a 5-fold higher content of saponins, and enrichment of steroidal glycosides carbohydrates, folic acid, and selenium, indicating nutritional superiority oven NG. Notably, SMG was evidenced to have significantly higher therapeutically active sulfur

compounds, i.e., 22-fold higher amount of alliin and >90-fold S-methyl-L-cysteine than NG. A cholesterol derivative, Cholesta-4,6-dien-3-ol, (3-beta), was uniquely identified only in SMG as a potential inhibitor with high binding affinity to the active site of exo-1,3-beta glucan synthase, an established anti-candida drug target crucial for the biofilm matrix formation. SMG has shown significantly superior fungicidal power, unlike NG's fungistatic effect. Further, treating rats with SMG extracts significantly reduced clinical symptoms such as arthritic index, joint stiffness, arthritis score, edema, hyperalgesia, and histopathological indices. This was associated with a significant reduction in the serum levels of RF, CRP, anti-CCP, and proinflammatory cytokines exhibiting strong anti-arthritic potential. SMG extracts could also significantly down-regulate the NF-κB/COX-2/iNOS/ROS signaling in the ankle joint tissues and RAW264.7 macrophage cells. Furthermore, macrophage cells treated with SMG principle phytocompounds elicit cytoprotection and anti-inflammatory effects and significantly prevent the oxidative damage induced by LPS endotoxin. The present study is the first report that identifies several unique phytochemical signatures of SMG along with a validation of the phyto-pharmaceutical efficacy of this folk garlic variety from the trans-Himalayan region. Overall, SMG extract showed remarkable preventive and therapeutic potential against oxidative stress, inflammation, candida infections, and rheumatoid arthritis, which were closely comparable to the therapeutic effects of standard clinical drugs and at par or even better than NG w.r.t. several study parameters. This research identified SMG as a potential therapeutic candidate worth deeper exploration for the treatment of rheumatoid arthritis. Also, the potential unique antifungal compounds identified in the SMG should be further investigated in pre-clinical and clinical studies.

SS22. A STRATEGY TO WIN OVER THE BACTERIA

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ABSTRACT

Our story revolves around a bacteria named *Pseudomonas aeruginosa*. It is one of the most feared pathogens in the hospital setting causing number of diseases such as cystic fibrosis, pneumonia, septicemia and much more. It is difficult to eradicate as it is resistant to a number of antibiotics. Antimicrobial resistance is a major threat to global human health and society at large. According to WHO, antibiotic resistance is a crisis that must be handled with utmost emergency. Resistance that develops in one organism can also spread rapidly and unpredictably can lead to resistance to a whole related class. The discovery of new antibiotics effective against Gram- negative bacteria- *P. aeruginosa* is a major challenge as it consists of an additional outer membrane posing a significant permeability barrier to the diffusion and efficacy of many antibiotics. Also, the more often antibiotics are used, the more bacteria adapt and find new ways to survive, which means they become resistant to antibiotics. So, we are employing a strategy called TROJAN HORSE STRATEGY. The name is taken from the Greek concept during a war called trojan war when Greeks used to enter the independent city of troy and win the war. The Greeks constructed a huge wooden horse and hid a selected force of men inside it. The Greeks pretended to sail away and the trojans pulled the horse. Every

bacterial species biosynthesizes few principal siderophores to import iron. Iron is essential for bacterial survival and bacteria secrete high affinity iron chelating molecules called siderophores. We are synthesizing structural mimics of siderophores of *P. aeruginosa*. Antibiotics are then conjugated to the mimics of siderophores in an appropriate manner that can be translocated with the siderophore acting like a trojan horse. Bacteria have been tricked in the name of siderophores and the entry of antibiotic into the bacteria is accessed. Hence, we designed and synthesized novel chemical entities as drugs having enhanced delivery into the bacteria consisting of a siderophore, a linker and an antibiotic, hence the delivery of antibiotic is facilitated. After entering into the bacteria, the linker can cleave (depending upon the mechanism of the linker) and antibiotic can run its course to kill or inhibit the growth of resistant bacteria. In this way, we have synthesized many compounds and their biological evaluation has been done, to win over antimicrobial resistance specifically for the deadly bacteria *P. aeruginosa*. I have also filed a patent (which is under examination) for a synthesized compound in this category which is hopefully going to help the researchers, doctors and patients who are dealing to eradicate *P. aeruginosa*.

SS23. UNVEILING THE ENIGMA OF LEUKODYSTROPHIES: THE QUEST FOR HOPE IN RARE NEUROLOGICAL DISORDERS

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ABSTRACT

In the vibrant city of Chandigarh, I, Yashu Sharma, a PhD scholar, and my supervisor in the Department of Pediatrics at PGIMER, embarked on a mission to unravel the mysteries of inherited neurometabolic disorders, aiming to transform the life of countless families. These conditions like leukodystrophies are rare and cruel, affecting the most vulnerable children. Leukodystrophies predominantly affect the white matter of the brain, leading to severe neurological symptoms and a diminished quality of life for affected individuals and their families. We were driven by a burning curiosity to understand the intricate pathophysiology of this condition and longed to unveil the secrets hidden within the tangled web of genetics, in search of new diagnostic methods and hope for therapies. As we continued to study more about the research topic, we discovered the difficult truth that our fellow citizens were dealing with. In India, the prevalence of childhood leukodystrophies remains shrouded in darkness due to a lack of awareness, limited resources, and the prohibitively high costs of diagnostic procedures. We recognized the paucity of literature on inherited leukodystrophies from India and saw an opportunity to make a difference. We knew that the first step towards hope was accurate diagnosis, and that could only come through a deep understanding of the diseases' genetic underpinnings. In the quest for answers, we harnessed the power of cutting-edge technology. We developed a custom gene panel tailored to the unique genetic landscape of the Indian population. This panel, designed with meticulous care, would serve as beacon of hope in the darkest of times. With unwavering determination, we are conducting genetic testing on children who display clinical and radiological signs of leukodystrophies. The groundbreaking genetic analysis is being performed in-house using Ion Torrent next-

generation sequencing technology. It is a bold step forward in the pursuit of accurate diagnosis and potential therapies. However, our mission extends beyond mere diagnosis. It involves uncovering new potential biomarkers utilizing mass-spectrometry technique that could quantify disease severity and evaluate therapeutic efficacy. Our research will illuminate a path forward, one that will offer hope to the silent sufferers and their families. The advent of next-generation sequencing had revolutionized the diagnosis of leukodystrophies, enabling early genetic confirmation and informed genetic counselling for affected families. Furthermore, the use of an in-house targeted genetic panel will not only have enhanced diagnostic accuracy but also significantly reduced costs, making it an accessible option for patients in resource-poor settings. Identification of sensitive biomarkers, will not only help in diagnosis but also to quantify disease severity and evaluate therapy effectiveness. These biomarkers could be instrumental in newborn screening, offering timely treatments for patients when the therapeutic window is narrow. In conclusion, this journey is a testament to the power of perseverance, innovation, and the human spirit. Our study has the potential to change the lives of countless children and their families, offering a ray of hope. This groundbreaking study can lead to better treatment outcomes and improved quality of life for patients.

SS24. DEVELOPMENT OF APOEFRAG™ FOR STROKE TREATMENT

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ABSTRACT

Stroke is India's 2nd most common cause of death, with 'one new stroke case every 40 seconds' and 'death every four minutes.' Despite this, tissue plasminogen activator (tPA) is the only approved medication for stroke treatment. However, tPA treatment also have limitations: limited window of administration (3-4.5 h), and only <1 % of Indian stroke patients get treatment within this golden window. There is a dire need to develop effective neuro-healing agent for stroke treatment. ApoE is a potential therapeutic candidate for treating CNS disorders and various ApoE-mimetic peptides are being developed to treat strokes and other CNS disorders (few have advanced in clinical trials). Thus, developing novel ApoE-mimetic peptides for stroke treatment is an accepted and validated approach. In this research program, we are developing ApoEFrag™ as a neuro-healing agent for stroke treatment. It is a novel peptide derived from human apoE. Our results suggest that ApoEFrag exerts anti-inflammatory activity in cellular and animal model of inflammation and provide neuroprotection in transgenic Drosophilia model of Alzimer disease as well as artery occlusion models of stroke.

SS25. ENHANCING LIVER CANCER TREATMENT: A NOVEL COMBINATION REGIMEN WITH LBURGINAZE™

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ABSTRACT

Hepatic cancer is the 6th most common cancer, reporting approximately 1 million cases worldwide annually and projected to reach 1.4 million by 2040. Moreover, it is now the 2nd leading cause of cancer death globally. Even though there are various potential therapies available, layman face significant challenges owing to their limited availability and high cost. Sorafenib and Lenvatinib are widely used as a first-line therapy for intermediate & advanced Hepatocellular Carcinoma (HCC) as it is the most cost-effective. However, its impact on overall survival is modest (extending life span by merely ~3-6 months accompanied by severe toxicities). With the projected rise in liver cancer cases, the urgency to develop novel treatment methods has intensified. It is well established that liver cancer cells are arginine-auxotrophic and arginine deprivation (utilising arginine-hydrolysing enzymes such as Arginase I) is a well-accepted and proven method to kill cancer cells. Human arginase I is ~35 KDa enzyme that is being developed for the treatment of arginine-auxotrophic malignancies such as liver cancer. However, due to its poor pharmacokinetic characteristics, native arginase has a limited therapeutic use. To address this, we are employing protein engineering to create engineered variants of rhArg I in which arginase is linked with a half-life extension partner. LBURGINAZE and TRANSARGINAZE are the two lead variants that we are developing. Biological characterization of LBURGINAZE suggest that it not only has better pharmacokinetic characteristics, but it also has strong anti-cancer activity in a variety of human cancer cell lines (in vitro) and potentiate the efficacy of 5 -Fluorouracil in the liver cancer xenograft model (in vivo). By introducing LBURGINAZE into the therapy regimen, we hope to improve the efficacy of Sorafenib and Lenvatinib in the treatment of liver cancer. This research proposes an innovative combination approach, harnessing the power of LBURGINAZE to enhance the impact of existing chemotherapeutic agents. The study's potential effects might be widespread, opening fresh avenues for the efficient treatment of liver cancer and improving patient outcomes in India.

SS26. THE MYSTERY OF ACOUSTIC SILENCE IN CAVE CRICKETS AND THEIR SURVIVAL

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ABSTRACT

The chirping of crickets is a sure-fire indicator that night has fallen. Unlike any other insect, crickets can produce sound by rubbing modified portions of their wings against one another. Since they are common and eat just about anything, crickets are vital to the environment because they break down dead matter and return nutrients to the ground. They function as both prey and predators in the food web. Crickets have a wide range of ecological niches,

from underground burrows to treetops. The Phalangopsides family of crickets stands out above other crickets due to the wide variety of species found in forest ecosystems. A number of species have been documented from caves, some of which have evolved truly to survive in cave environments (troglobitic species) or use cave as refuges (cavernicolous species). In contrast to the chaotic world above ground, caves are very unique. There is complete darkness there, temperature is steady throughout the year with very high humidity around 95%. Caves are occupied by bats, amphibians, reptiles, fishes and crickets. Crickets hold significant ecological importance as energy carriers, making them the second keystone species inside caves, after bats, that supports many other animals and which the ecosystem could not function without. The cave cricket is sometimes considered the dominating species in cave ecosystems because of its abundance and significance to the food basis in many caverns. Many of India's caves may be found in the country's major limestone areas, which include the states of Madhya Pradesh, Rajasthan, Andhra Pradesh, Gujarat, Chhattisgarh, Tamil Nadu, and Meghalaya. Most cave crickets, like other crickets, have highly developed wings with sound-making systems which they use to attract conspecific females who are at a distance, for reproduction. Females are mute therefore, respond by listening and moving towards the calling male of its own species. However, in one of my recent studies, I came across a new species of cave-dwelling cricket that lacked both a tympanum as an auditory organ and a sound-producing wing. The Kura cave in Chhattisgarh is the discovery site for the new species *Arachnomimus (Indimimus) jayanti*. Until recently, the only *Arachnomimus* species known from India were the lepidus and maindroni from Tamil Nadu. Kurra cave in Chhattisgarh is the only known location of *Arachnomimus (Indimimus) Jayanti* in India. The cave's entrance is enormous, therefore, allows enough of light to filter in and illuminate the dark interior. The majority of this cricket species' members and its offsprings were discovered in the cave's twilight zone that receives a small amount of sunlight. There were millions of insectivorous bats crowded into the cave's innermost part, and the ground was coated with a thick bed of bat guano. This species of cricket was exceptionally good at hiding among the cave's walls, both as adults and subadults. Since they were only discovered in the cave's twilight zone, it's possible that at night they venture outside to forage and that during the day they roost inside. Since the *Arachnomimus (Indimimus) jayanti* is acoustically silent and the Kura cave is so massive, the males and females are distantly apart from each other. My future research will focus on figuring out how these fascinating organisms communicate with one another and how they manage to evade predatory bats.

SS27. ROHAN WHISPERS: BREAKING THE BOUNDARIES IN AUTISM RESEARCH

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ABSTRACT

Once upon a time, I came across Rohan, my neighbor, and I was intrigued by his actions. His social interactions were different from those of the other kids, and his environment seemed to present special difficulties. I had little knowledge of autism until I discovered one day that Rohan had it. Being a science student, I was curious and started reading books, articles, and

online resources to learn more about autism. I couldn't help but wonder how and why this condition spread. I became fascinated by the intricate and enigmatic nature of autism and realized there was still so much to learn. Driven by a burning desire to make a difference, I decided to take a bold step. I wrote a proposal to a prestigious research institute, expressing my earnest desire for understanding the potential of Wnt signaling pathway in autism. During my Ph.D. interview, when I confidently stated that I wanted to work on autism some people in the room couldn't help but laugh, doubting the feasibility of my aspirations. Undeterred by their skepticism, I delved deeper into my studies. My determination led me to discover that Valproic acid can be used to create a rodent model of autism, providing a valuable tool for research. This discovery fueled my passion even further, knowing that I now had a way to explore and understand the intricate mechanisms underlying autism. Hours turned into days, days into months, and my dedication to the study of Wnt signaling in autism grew stronger. Through tough times (lockdown), painstaking research, and countless experiments, I began to unravel the intricate web of connections between this signaling pathway and autism. It became clear that Wnt signaling played a pivotal role in the development and manifestation of autism. With each breakthrough, my confidence soared, and my sense of purpose deepened. I knew I was onto something profound, something that could change the lives of individuals like Rohan and their families. My journey into autism research had not only become a personal mission but a calling to illuminate the path toward understanding this enigmatic condition. In the end, my passion, dedication, and belief in the potential for Wnt signaling to unlock the mysteries of autism led to groundbreaking discoveries that would transform the landscape of autism research. Through persistence and unwavering determination, I had not only earned the respect of those who once doubted me but had also opened new doors of hope for the countless individuals affected by autism.

SS28. SAVING THE DISTINCT TASTE OF KANGRA TEA IN A TINY FROZEN SPACE

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ABSTRACT

As I was sipping my morning cup of flavorful Kangra tea in a cold early morning of December at my hostel, something strange struck me, what if one day I get deprived of this distinct taste of tea. From there my journey began to know more about Kangra tea, their history and current status. I went through the literature and research regarding this area and found that that Kangra tea needs attention for conservation. Tea has lagged behind in term of conservation and project development as compared to other major crops. Although few initiatives have been taken in this area yet a lot many are needed.

Why Kangra Tea needs immediate attention for conservation?

The 1905 earthquake in district Kangra of Himachal Pradesh, led to lot of devastation and abandoning of the tea gardens that had an adverse effect on its market value. We cannot afford to let history repeat itself and lose such an important type of tea to any catastrophe. I also found out that some of varieties of tea were being lost as tea planters were generally uprooting the old population and replacing them with high yielding cultivars which ultimately resulted

in loss of diversity. So, what should be our back up plan to conserve this flavorful tea so that we do not lose it forever?

Stepping Stone to my Goal

The first thing that came to my mind is, what we do with the vegetables, cooked food when we want to preserve them? We store them in refrigerator to keep them fresh for long time. What if I get a freezer where I can freeze the plant for years and on thawing, get a complete plant out of it? This doesn't sound to be less than a miracle. This type of freezing is usually done in Liquid Nitrogen (LN) having ultra low temperature of -196˚C. LN freezing/cryopreservation has been used to preserve sperm and eggs of animals and human for a long time.

So this appeared to be a key solution to all our problems. But tolerating such low temperature is not everbody's cup of tea. The plant needs to be prepared to tolerate such a low temperature. So my role was to develop a sustainable protocol for Kangra tea and its long-term conservation.

To start with, I collected tea cuttings of a Kangra tea cultivar from Banuri Tea Gardens, Palampur. They were brought to laboratory, and after sterilisation, I was able to establish the *in vitro* cultures of the cultivar under aseptic condition with controlled growth nutrients, temperature and light. Regular subculturing enabled me to have sufficient plant material. I chose shoot tips as explant for my experiment because of its meristematic and virus free nature. Just to evaluate, I dipped my explant directly into liquid nitrogen tank and found that all the material died. This indicated that when exposed to such a low temperature (-196˚C) water inside the plant cells turned into ice crystals which eventually lead to rupturing of cell membrane and cell death. Therefore, optimisation of the water content in the plant cell to avoid dedydration, ice crystal formation and cryoinjury became my target with the help of cryoprotectants.

I dissected shoot tips of Kangra tea cultures and treated with sucrose for few hours for initiation of osmosis. A gradual osmosis procedure helped to make it tolerant to cold shock of liquid nitrogen. With this approach, shoot tips were exposed to higher concentration of sucrose and Glycerol which lowered the freezing point and enhanced super cooling. The shoot tips were now exposed to Plant Vitrification Solution 2 (PVS2) which is a "boon" because of which amount of unfrozen water increased and glass transition was observed. Now the sufficiently dehydrated explant was ready to be dipped in Liquid nitrogen. After immersion in LN the shoot tips could be stored for days, weeks, months and even years. PVS 2 has a slight toxic effect, so it is important to dilute this effect by unloading it into high sucrose concentration. The shoot tips were then transferred to recovery media that helped in its regeneration. Maximum regrowth of 33 % was achieved but seemed to be too low.

My next challenge was to enhance the recovery percentage. In my subsequent experiments, I tried several preconditioning treatments which were figured out for better survival and regrowth rate. High concentration of sucrose was applied to the *in vitro* grown plants for one month of period and then subjected to above standardized protocol which gave recovery of 35 %. Cold acclimatization for one and two months of period didn't work well for tea whereas synergetic effect of Abscisic acid (ABA) and cold acclimation resulted in relatively higher regrowth and recovery. The cumulative effect of ABA and proline for one month of period resulted in higher regrowth of 60 % which is an appreciable percentage of regrowth.

A game changer arrived

Still, I was optimistically unsatisfied and this zeal pushed me to enhance the regrowth percentage by trying various other techniques. Aluminum cryoplate – a new technique best known for its rapid cooling and warming was used that significantly enhanced the regrowth percentage to 75 % that means if I cryopreserved 100 shoot tips , 75 plants recovered post freezing. This is the first report from India using this technique.

My research would contribute to the field of Biotechnology and will give a successful way for long term conservation of this important Kangra tea cultivar. It will offer the insurance collection and meet the potential demand for this specific cultivar in the changing environment. Finally, my love for Kangra tea that led to all mind-boggling questions got answered and I am at peace now.

FROM THE DESK OF COORDINATOR

Prof. Neena Capalash
Coordinator
CHASCON 2023

CHASCON 2023 is happening at a time when the country is riding the wave of glory for the successful soft landing of Chandrayan -3 on the South Pole of moon and the launch of Solar Mission Aditya L1 by ISRO and unprecedent leadership of G-20 presidency. In this charged atmosphere over the scientific feats, I am confident the scientific temper is going to be high during the conference. This will lead to fruitful deliberations, interactions and new collaborations. Having Padma Shri awardee Professor Balram Bhargava, President NASI and who as the Director General of ICMR led India's Fight against Covid-19 Pandemic, and Professor Annapurani Subramaniam, Director Indian Institute of Astrophysics, Bengaluru, who is associated with the Lunar and Solar Missions and Dr Vilas Tonapi, an authority on millets the super crop, as the speakers makes CHASCON 2023 special.The online address by the former Editor -in -Chief of Science and Professor at California University , on Importance of Science, will be very enlightening. I am happy that from CHASCON 2023 on, this annual conference which was started as a regional event by the then Vice-Chancellor Professor RC Sobti in 2007, will be a National Event.

Today, as we face numerous challenges on the global scale like Covid -19, climate change, nutrition and food security, global scientific interventions have shown us the way out, underscoring the theme of CHASCON 2023 – "Global Science for Global Wellbeing". CHASCON 2023 offers a platform to present new knowledge, learn from interactions with experts and peers, foster new collaborations for meaningful research for the wellbeing of society. Expo-CHASCON 2023 will showcase the innovations and scientific activities of different participating institutions. There will be presentations by the selected young researchers and budding innovators under the CRIKC- CHASCON Shodh Samvad. In sync with the start-up culture and Make in India ecosystem, a dedicated session on Innovator Ki Kahani Start-up Success Story - an interactive panel discussion with eminent start-up enablers and young entrepreneurs on board, will be an engaging session of CHASCON 2023 for young researchers and students.

The vision of our worthy Vice – Chancellor, Professor Renu Vig, support of Dean of University Instruction, Professor Rumina Sethi, personal involvement and guidance of Director Research and Development Cell, Professor Harsh Nayyar made CHASCON 2023 possible. Since no event is possible without funds, RUSA grant laid the foundation for CHASCON 2023 which was strengthened by financial support from Panjab State Council for Science and Technology,Chandigarh, SERB DST, New Delhi and UT DST, Chandigarh and other sponsors. It is always a team work that defines the success of an event. I had a wonderful experience as the Coordinator of CHASCON 2023, all to the unstinted support of my co-coordinators, Prof Ajay Mittal and Dr Yogesh Rawal along with a dedicated team of colleagues and students.

We sincerely hope that CHASCON 2023 will be a fulfilling and enriching experience for the participants.

Neena Capalash

Professor Neena Capalash

Coordinator CHASCON 2023

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The Rashtriya Uchchatar Shiksha Abhiyan (RUSA) or National Mission for Higher Education is a flagship program of the Ministry of Human Resource Development, Government of India. Panjab University has been supported under this program for about a decade. In a recent spell (RUSA 2.0), the university got support through the "Research, Innovation and Quality Improvement" component. Under the concept of Entrepreneurship, Employability and Innovation (EEI) hub, Panjab University has developed Panjab University Incubation Center, Pre-incubators in Physical, Chemical, Biological and Pharmaceutical Sciences. In addition, Skill centers at the department of Anthropology, Botany, Geography, Geology, Zoology as well as Skill centers in communication and Social Sciences skills have also been developed. The RUSA funding has been actively supporting several workshops, skill development courses, seminars, and conferences, thus giving impetus to the research and development at Panjab University. Further details about various programs can be found at RUSA website eei.puchd.ac.in.

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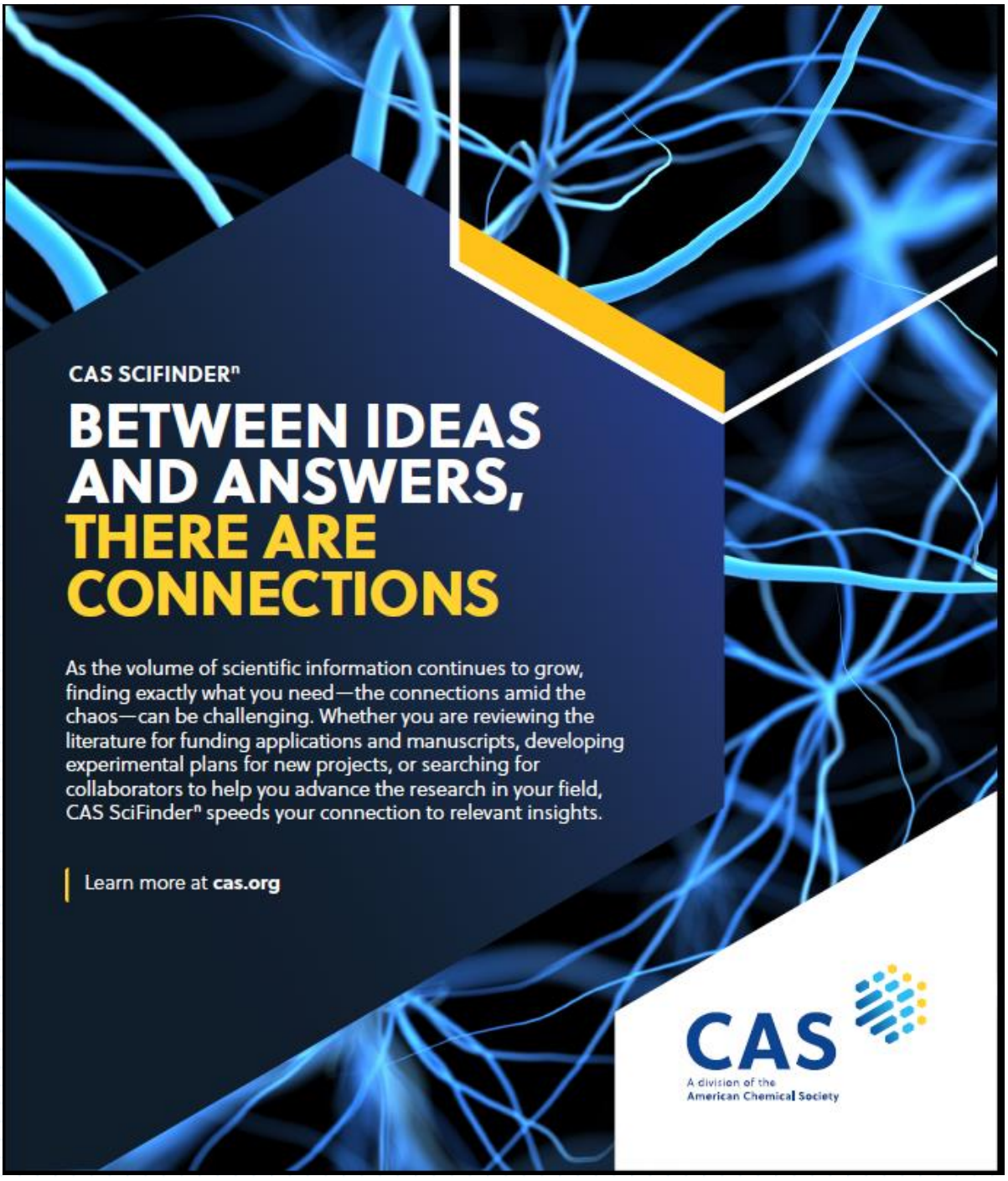
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