

School of Health & Medical Sciences Adamas University, Kolkata

Organizes

4th INTERNATIONAL CONFERENCE HEALTHMEDICON 2025

On

UNVEILING OPPORTUNITIES IN GLOBAL HEALTHCARE LANDSCAPE

SCIENTIFIC ADVANCEMENTS, INNOVATIONS & RECENT TRENDS

In collaboration with

Universiti Teknologi MARA (UiTM), Malaysia

In association with



APTI, India
Bengal Branch



Bioequivalence Study Center
Jadavpur University, Kolkata



Alona Life Sciences
Salt Lake, Kolkata



E-YUVA CENTRE
Adamas University, Kolkata

SOUVENIR



Thursday & Friday, 30th & 31st January, 2025



APJ Abdul Kalam Convention Centre, Adamas University

Conference proceedings in



International Journal of Applied Pharmaceutics

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ABOUT THE SOHMS



The School of Health & Medical Sciences (SOHMS) was established in a lush green set-up of Adamas University at the Adamas Knowledge City Campus on Barasat-Barrackpore Road, Kolkata in 2016. SOHMS is established to create and disseminate knowledge for producing quality healthcare professionals with global standards. Presently, SOHMS includes the Department of Pharmaceutical Technology (D. Pharm, B. Pharm, M. Pharm in Pharmaceutics & Pharmacology and Ph.D. in Pharmacy), the Department of Allied Health Science (BMLT, B. Optometry, B. Sc. in Food, Nutrition and Dietetics) and the Department of Psychology. Striving on the path to fulfill the vision, SOHMS has been regularly organizing international/ national conferences, workshops, and invited lectures with the participation of eminent experts from field Academics, Research, Pharmaceutical Industries, and Regulatory authorities of national and international repute. These knowledge-based interactions trigger students' critical thinking and independent learning aspects, exposing them to the contemporary trends prevalent in the healthcare sector.



ABOUT THE UiTM



Universiti Teknologi MARA (UiTM) is the largest comprehensive university in Malaysia providing innovative education with state-of-the-art infrastructure and technology within reach at its 34 campuses, 4 colleges of studies, 14 faculties, and 9 academic centres all over the country. UiTM offers over 500 academic programmes at Foundation, Pre-Diploma, Diploma, Bachelor's, Master's, and PhD levels, as well as Professional Programmes. It continues to expand access to higher education, playing its role in nation-building by unleashing potentials and shaping the future.

Amongst its long list of recent accolades, UiTM is placed =587 in the QS World University Rankings 2025, ranked 101th in the QS Asia University Rankings 2025, and was ranked as =607 for QS World University Rankings: Sustainability 2025, 151st in Asia and 11th in Malaysia.

The Hospitality and Leisure Management subject was in the 50th–100th place in the world, and overall, 18 UiTM subjects are ranked in the QS World University Rankings by Subject 2024. Moreover, UiTM was in the 136 position in the Times Higher Education (THE) Interdisciplinary Science Rankings (ISR) 2025 and is the proud recipient of the 3G SDGs Championship Award 2022. In June 2022, UiTM received the Reader's Digest Trusted Brand Gold Award for the 12th time in the public university category and for the first time, UiTM was bestowed The BrandLaureate BestBrands Awards 2022. For the UI GreenMetric World University Rankings 2024, UiTM climbed up to the 107th position globally and 6th among Malaysian institutions. With over 770,000 alumni in science, technology, humanities, and entrepreneurship, UiTM offers opportunities to shape leaders at national, industry, and global levels and is well poised to become a globally renowned university by 2025.



ABOUT THE BESC



The Bioequivalence Study Center (BESC) at Jadavpur University, West Bengal, India, established in 2005, focuses on conducting bioequivalence studies for pharmaceutical formulations. It aims to assess the safety, efficacy, and bioavailability of generic drugs compared to their branded counterparts. The center provides services in clinical testing, formulation development, and pharmacokinetic data analysis, contributing to the regulatory approval of generic medications in India and beyond.

ABOUT THE CONFERENCE



The 4th International Conference, HEALTHMEDICON 2025, will be a significant event for the global healthcare community. Organized by the School of Health & Medical Sciences, Adamas University, Kolkata, in collaboration with the Universiti Teknologi MARA (UiTM), Malaysia, the conference will revolve around the theme: "Unveiling Opportunities in Global Healthcare: Scientific Advancements, Innovations & Recent Trends."

This conference will bring together healthcare professionals, researchers, academicians, and industry leaders from across the world in a hybrid mode, allowing both in-person and virtual participation. It aims to showcase the latest trends, innovations, and scientific advancements that are shaping global healthcare, fostering discussions on future opportunities and collaborations. The program will include keynote lectures, panel discussions, poster, e-poster, and oral presentations. A wide range of fields such as Pharmacy, Optometry, Public Health, Dietetics, Nutrition, and Hospital Management will be covered. These interactive sessions will provide insights into cutting-edge research and emerging technologies, sparking new ideas and partnerships.

By addressing critical healthcare issues, HEALTHMEDICON 2025 will offer a valuable platform for networking and knowledge exchange. Participants will engage in meaningful discussions on innovation, sustainability, and global healthcare advancements, making it a must-attend event for professionals and researchers alike.



Abstract Book

4th International conference

HEALTHMEDICON 2025

On

Unveiling Opportunities in Global Healthcare Landscape: Scientific Advancements, Innovations & Recent Trends

30th – 31st JANUARY, 2025

Organized by

**School of Health & Medical Sciences, Adamas University,
Kolkata, 700126**

In collaboration with

Universiti Teknologi MARA (UiTM), Malaysia

In association with

- **APTI**, India, Bengal Branch
- **Bioequivalence Study Center**, Jadavpur University, Kolkata
- **Alona Life Sciences**, Salt Lake, Kolkata
- **E-YUVA CENTRE**, Adamas University, Kolkata

Conference proceedings in

International Journal of Applied Pharmaceutics (Int J App Pharm)

Declaration

“This publication is released with an understanding that the organizers of the national conference shall not be held responsible for any plagiarism charges, errors, omissions and/or discrepancies of the study material submitted by the authors.

MESSAGE FROM HON'BLE CHANCELLOR



It is with profound pleasure and immense honour that I extend a warm welcome to all distinguished delegates, speakers, researchers and participants of the 4th International Conference on Healthcare, **HEALTHMEDICON 2025**, organized by the esteemed School of Health & Medical Sciences, Adamas University, in collaboration with our prestigious national and international partners.

The theme for this year's conference, "Unveiling Opportunities in the Global Healthcare Landscape: Scientific Advancements, Innovations & Recent Trends," reflects the dynamic nature of the healthcare sector. It encapsulates the confluence of challenges and boundless opportunities that continue to shape the future of healthcare. This gathering is a tribute to the collective spirit of knowledge-sharing and collaboration, as we unite academicians, researchers, industry leaders and students to deliberate upon and exchange transformative ideas.

HEALTHMEDICON 2025, set against the backdrop of a rapidly evolving healthcare landscape, serves as a vibrant platform to encourage the exchange of pioneering research, innovative practices and cutting-edge scientific developments.

At Adamas University, we have always strived to cultivate an environment that encourages innovation, collaboration and the pursuit of excellence. Events like **HEALTHMEDICON** not only strengthen our academic endeavours but also reinforce our commitment to contributing to the global healthcare landscape.

I take this opportunity to express my gratitude to all the collaborators, speakers, and participants for their valuable contributions and enthusiasm. I am confident that this conference will act as a source of profound insight and lay the foundation for impactful advancements in healthcare.

As we commence this enriching journey of learning, discovery and collaboration, I am confident that **HEALTHMEDICON 2025** will serve as a cornerstone of knowledge, steering us towards a future enriched with scientific breakthroughs and meaningful healthcare innovations.

May this conference be a resounding success and a catalyst for impactful advancements in the field of global healthcare.

With warm regards,

A handwritten signature in black ink, appearing to read "Samit Ray".

Prof. (Dr.) Samit Ray
Founder and Chancellor, Adamas University
Kolkata, West Bengal

MESSAGE FROM THE VICE-CHANCELLOR



On behalf of Adamas University I sincerely and warmly welcome the esteemed participants to the HEALTHMEDICON 2025. I put on record sincere thanks to the Universiti Teknologi MARA (UiTM) of Malaysia for extending its hand of cooperation to the School of Health & Medical Sciences of our University to organize this Conference.

The theme of this year's conference, "Unveiling Opportunities in Global Healthcare Landscape: Scientific Advancements, Innovations & Recent Trends," is particularly relevant in the context of the Covid-19 pandemic which had thrown the human society out of gear. Recent developments have proved that universalization of health-care requires a concerted global effort, and I am sure the present conference will provide a platform to the practitioners of pharmaceutical sciences to deliberate on this issue. In tune with the National Education Policy of the Government of India, Adamas University seeks to foster a link between teaching-learning process and industry so that inventions can become innovations. I congratulate the organisers of the Conference for creating an opportunity for dialogues not only between the scientists themselves, but also between the researchers and the industry,

At the same time, it is pertinent to remember that although the world has attained significant breakthroughs in healthcare, much of the fruits of this development remain out of reach for the common people. Time has thus come to discuss how the progress of science and technology can be linked with distributive justice. I do hope the distinguished participants in the Conference will address this issue while they share their own researches,

I compliment my colleagues in the Pharmacy Department for taking up the challenge of hosting this prestigious Conference. They have proved their commitment to their University's aim to foster innovation, collaboration, and excellence in education and research. I am confident that the Conference will be fruitful and open new entry points in the realm of research in pharmaceutical sciences. I wish the conference every success.

A handwritten signature in black ink, appearing to read "Suranjan Das".

Prof. Suranjan Das
Vice Chancellor, Adamas University,
Kolkata, West Bengal – 700126, India

MESSAGE FROM THE REGISTRAR



It is with great pride and enthusiasm that I extend my warmest greetings to all participants, speakers, and organizers of the 4th International Conference, “HEALTHMEDICON 2025”, hosted by the School of Health and Medical Sciences (SoHMS), Adamas University, Kolkata. This prestigious event, scheduled for January 30th and 31st, 2025, serves as a platform to foster dialogue and collaboration in addressing the evolving opportunities in India’s healthcare landscape.

The theme for this year’s conference, “Unveiling Opportunities in India’s Healthcare Landscape: Scientific Advancements, Innovations, & Recent Trends,” is both timely and inspiring. It reflects the dynamic transformation occurring in the healthcare sector, driven by groundbreaking innovations, multidisciplinary research, and the integration of cutting-edge technologies. As we navigate this era of rapid change, it is imperative to explore how these advancements can contribute to addressing the pressing challenges of healthcare accessibility, quality, and affordability in India and beyond.

I congratulate the School of Health and Medical Sciences, Adamas University, for their unwavering commitment to academic excellence and their dedication to hosting this significant event. I also extend my heartfelt gratitude to the distinguished speakers, participants, and sponsors whose contributions are instrumental in making HEALTHMEDICON 2025 a resounding success.

Let us embrace this opportunity to learn, innovate, and collaborate for a healthier future. Wishing the conference grand success and hoping it leaves an enduring impact on the global healthcare community.

A handwritten signature in black ink, appearing to read "Souvik Roy Choudhury".

**Prof. (Dr.) Souvik Roy Choudhury
Registrar, Adamas University, Kolkata**

MESSAGE FROM THE CHAIRMAN



Dear Esteemed Guests, Distinguished Speakers, Researchers, Industry Professionals, and Students,

It is with immense joy and pride that we welcome you to HEALTHMEDICON 2025, the 4th International Conference on "Unveiling Opportunities in Global Healthcare: Scientific Advancements, Innovations & Recent Trends," hosted by the School of Health & Medical Sciences, Adamas University, Kolkata, in collaboration with Universiti Teknologi MARA (UiTM), Malaysia.

Healthcare is at a transformative juncture, and this conference offers an exceptional platform to explore, discuss, and advance the innovations shaping its future. Over the conference days, we are thrilled to provide a confluence of ideas, insights, and groundbreaking research across diverse fields such as Pharmacy, Optometry, Public Health, Dietetics, and Hospital Management.

We are honored to have renowned speakers and experts from around the globe, bringing their wealth of knowledge and pioneering visions. These sessions, along with interactive discussions, presentations, and networking opportunities, promise to enrich your understanding and inspire new collaborations.

To our students and researchers, we encourage you to actively engage and leverage this platform to showcase your work, learn from experts, and build connections that may shape your professional journey. For our industry partners, your participation underscores the critical bridge between research and practical implementation, helping us envision sustainable and impactful healthcare solutions.

Let us collectively seize this opportunity to exchange ideas, foster innovation, and chart a path toward a healthier, more inclusive world.

Thank you for being a part of this significant event. Together, let us make HEALTHMEDICON 2025 a milestone in the advancement of global healthcare.

Warm regards,

A handwritten signature in black ink that reads "Rudra Prasad Saha".

Prof. (Dr.) Rudra Prasad Saha
Dean (Officiating), School of Health and Medical Sciences
Adamas University, Kolkata

MESSAGE FROM ASSOCIATE DEAN



Ladies and gentlemen, esteemed dignitaries, distinguished speakers, scholars, and bright young minds. It is with immense pleasure and profound honor that I stand before you today to extend a heartfelt welcome to HELATHMEDICON 2025—a beacon of innovation, knowledge, and collaboration in the realm of health sciences, hosted by the School of Allied Health Sciences, Adamas University, Kolkata. This gathering is not merely a conference but a grand celebration of brilliance, an arena where the confluence of ideas, research, and innovation promises to illuminate the path toward a healthier, more equitable future. At Adamas University, we hold the firm belief that the cornerstone of progress lies in the relentless pursuit of knowledge and the cultivation of synergies across disciplines. HELATHMEDICON 2025 exemplifies this ethos—a melting pot of ideas and a crucible for groundbreaking discoveries that have the potential to transform lives on a global scale. This year's event is a tribute to the indomitable spirit of inquiry, bringing together an extraordinary congregation of visionaries—academics, researchers, clinicians, policymakers, and students. Each one of you carries within you the spark to ignite change, to push boundaries, and to reimagine the future of healthcare. Together, we embark on a journey of discovery, collaboration, and innovation, united by a shared vision of excellence and a passion for making a difference. As we delve into the stimulating sessions, thought-provoking keynote addresses, hands-on workshops, and enriching discussions over the coming days, let us embrace the opportunity to inspire and be inspired. Let us recognize the immense responsibility we bear as stewards of health and wellness and commit to harnessing the power of collective wisdom to confront the challenges of our times with courage and ingenuity. Allow me, as a healthcare professional and a representative of the School of Allied Health Sciences, to express my deepest gratitude to each of you—our speakers, participants, organizers, and partners—who have worked tirelessly to bring this vision to life. Your presence and contributions infuse this conference with meaning and purpose. To our esteemed guests from across the globe, I extend the warmest of welcomes to the cultural and intellectual capital of India—Kolkata. May the vibrancy of this city and the spirit of Adamas University enhance your experience and leave an indelible impression on your hearts. With unwavering optimism and heartfelt enthusiasm, I invite you to immerse yourselves in the wonders of HELATHMEDICON 2025. Let this gathering serve as a catalyst for innovation, collaboration, and meaningful change in the realm of healthcare and beyond. Welcome to Kolkata, welcome to Adamas University, and welcome to HELATHMEDICON 2025!

A handwritten signature in blue ink, appearing to read "Joy Basu".

Dr. Joy Basu
Chief Executive Officer (Health Science Vertical),
Associate Dean, School of Allied Health Sciences, Adamas University, Kolkata
Former CXO and Vice President, Apollo Hospitals Group, India

MESSAGE FROM ASSOCIATE DEAN



It is with great pleasure that I extend my warm greetings and heartfelt congratulations to all the participants and organizers of the *International Conference on Unveiling Opportunities in the Global Healthcare Landscape: Scientific Advancements, Innovations & Recent Trends*, organized by Department of Pharmaceutical Technology, School of Health and Medical Sciences, Admas University.

The rapidly evolving field of healthcare is a testament to the power of collaboration, innovation, and the relentless pursuit of solutions to global health challenges. As we stand at the intersection of science, technology, and patient care, it becomes increasingly evident that the future of healthcare lies in our collective ability to harness groundbreaking advancements in medicine, biotechnology, and healthcare delivery systems.

This conference serves as an essential platform for the exchange of knowledge, ideas, and experiences, offering invaluable insights into the latest scientific breakthroughs and trends that are shaping the future of global healthcare. The discussions and presentations will not only enhance our understanding of the current landscape but will also inspire new ways to address the complex health issues we face today.

I extend my sincere gratitude to all the distinguished speakers, researchers, and delegates who have come together to contribute to this important event. Your dedication and passion for advancing healthcare are truly commendable, and I am confident that the ideas shared during this conference will serve as a catalyst for future innovations and collaborations.

I wish you all a successful and enriching experience, and I look forward to the exciting developments that will emerge from the discussions during this conference.

Warm regards,

A handwritten signature in black ink, appearing to read "Sanjay Dey".

Prof. (Dr.) Sanjay Dey
Associate Dean
Department of Pharmaceutical Technology
School of Health and Medical Sciences
Admas University, Kolkata

MESSAGE FROM THE HEAD OF THE DEPARTMENT OF PHARMACEUTICAL TECHNOLOGY



It is my great pleasure to extend my heartiest greetings you all to the 4th International Conference HEALTHMEDICON 2025 at Adamas University, Kolkata, India on 30th & 31st January 2025. With the focal theme, “Unveiling Opportunities in India’s Healthcare Landscape: Scientific Advancements, Innovations, & Recent Trends”, the conference rightly addresses the dynamic intersections between academia, industry and healthcare.

As the healthcare landscape evolves rapidly, we must continually reflect, learn and adapt. This evolution is characterized by the integration of advanced digital solutions, such as telemedicine and health apps, which are enhancing accessibility and convenience for patients, particularly in rural and underserved areas. Cutting-edge technologies, including Artificial Intelligence (AI), machine learning, and big data analytics, are being leveraged to improve diagnostic accuracy, streamline operations, and personalize treatment plans, ensuring better health outcomes.

HEALTHMEDICON 2025 provides an invaluable opportunity for leaders, educators, researchers and students to come together, not just to share knowledge, but to reimagine the possibilities within our profession.

I look forward to welcoming you to all to this great event and urge everyone to actively participate in shaping the future of Indian healthcare system.

A handwritten signature in black ink, appearing to read "Suvendu Kumar Sahoo".

Dr. Suvendu Kumar Sahoo
Organizing Secretary, HEALTHMEDICON 2025,
HoD, Department of Pharmaceutical Technology,
School of Health & Medical Sciences
Adamas University, Kolakata-700126

MESSAGE FROM THE TIC, DEPARTMENT OF ALLIED HEALTH SCIENCE



Welcome to "HEALTHMEDICON 2025"

I am delighted and honored to welcome you all to Adamas University School of Health and Medical Science's 4th International Conference, "HEALTHMEDICON 2025." The subject for this year, "Unveiling Opportunities in India's Healthcare Landscape: Scientific Advancements, Innovations, & Recent Trends," perfectly encapsulates the revolutionary shifts reshaping our healthcare industry.

India is positioned to be a global leader in the advancement of medical science and innovation because of its vibrant healthcare ecosystem and rich variety. For healthcare professionals, researchers, academicians, business executives, and students, this conference provides an essential forum for discussing the most recent developments and future prospects in our sector.

We are honored to have a stellar lineup of international experts, panels, and keynote speakers who will offer their perspectives on important subjects, such as:

- New technologies are transforming the way healthcare is provided.
- Teamwork in achieving excellence in clinical and research.
- Techniques for overcoming obstacles and taking advantage of chances in India's healthcare system.

In addition to the informative talks and seminars, this event is a celebration of creativity and teamwork—an opportunity to create new alliances, share ideas, and motivate one another in our common goal of enhancing healthcare outcomes for everybody.

Let's set off on this two-day voyage of learning and exploration with the goal of not just learning but also making a lasting impression that extends beyond this event.

I'd like to welcome you to HEALTHMEDICON 2025 once more. Let's make it a memorable, enlightening, and exciting event!

Pablo Chandra

Mr. Pablo Chandra
Organizing Secretary, HEALTHMEDICON 2025,
Teacher In Charge, Department of Allied Health Science
School of Health & Medical Sciences
Adamas University, Kolakata-700126

MESSAGE FROM CONVENER



It is with immense pleasure and pride that I welcome you all to “4th International Conference on “Unveiling Opportunities in India’s Healthcare Landscape” Scientific Advancements, Innovations, & Recent Trends” In collaboration with the Universiti Teknologi, MARA, (UiTM) Malaysia, **HEALTHMEDICON 2025**, our international conference dedicated to advancing the frontiers of health, medicine, and innovation. This gathering brings together distinguished researchers, clinicians, academicians, and industry leaders from across the globe, united in our shared mission to address the evolving challenges of healthcare and to shape the future of medicine.

HEALTHMEDICON 2025 stands as a testament to the power of collaboration and the relentless pursuit of knowledge. This year’s theme, “Innovating Healthcare for a Healthier Tomorrow,” resonates deeply as we confront global health challenges and explore groundbreaking solutions that promise to transform the lives of millions. Our carefully curated sessions, workshops, and keynote addresses are designed to inspire meaningful dialogue and foster multidisciplinary approaches to healthcare innovation.

As we embark on this journey together, I encourage each of you to engage actively, share your expertise, and build lasting connections. The diverse perspectives represented here enrich our understanding and propel us toward impactful outcomes. Let us seize this opportunity to exchange ideas, inspire one another, and collaborate for a healthier and more equitable world.

I extend my heartfelt gratitude to the organizing committee, sponsors, and volunteers whose tireless efforts have brought this conference to fruition. Your dedication and commitment are the driving forces behind HEALTHMEDICON 2025.

Once again, welcome to this extraordinary event. May the insights, partnerships, and innovations born here leave a lasting imprint on the global healthcare landscape.

Warm regards,

A handwritten signature in black ink, appearing to read "Biswajit Basu".

Dr. Biswajit Basu
Convener, HEALTHMEDICON 2025,
Professor, Department of Pharmaceutical Technology,
School of Health & Medical Sciences
Adamas University, Kolakata-700126

MESSAGE FROM CO-CONVENER



It is a great honor and privilege to serve as a Co-Convener of the 4th International Conference - **HEALTHMEDICON 2025** being held in the hybrid mode organized by the School of Health & Medical Sciences, Adamas University, Kolkata. Education is always a sign of development and learning. This two-day event is meant to bring healthcare professionals/ including eminent speakers globally onto a single platform to share and update on the advancements in healthcare research and innovation. We have received an overwhelming response from the participants and would like to thank everyone for displaying such enthusiasm. As co-convener, I extend my warm welcome to all our participants. I am very much confident that the participants will be able to upgrade their knowledge and skills, about healthcare, through interactive sessions including deliveries and talks from eminent speakers, and oral and poster presentations from researchers showcasing their research. I extend my heartfelt gratitude to the respected Chancellor, Vice Chancellor, Registrar, and all staff from Adamas University for their constant support and encouragement. The organizing committee sincerely thanks all the sponsors for supporting our mission and making this grand event possible. Outside of the conference, I hope that the participants will enjoy some of the many attractions found in and around our beautiful campus ADAMAS UNIVERSITY campus. The cohesive efforts of a dedicated and committed team become necessary for organizing such conferences. We are fortunate enough to have such a hardworking team with us. and other contributors for their sparkling efforts and their belief in the excellence of **HEALTHMEDICON 2025**.

I wish for the grand success of the International Conference **HEALTHMEDICON 2025**.

Soma Das.

Dr. Soma Das
Co-Convener, HEALTHMEDICON 2025,
Associate Professor, Department of Pharmaceutical Technology,
School of Health & Medical Sciences
Adamas University, Kolakata-700126

MESSAGE FROM CO-CONVENER



It is an immense honor to serve as the Co-Convenor of the 4th International Conference—**HEALTHMEDICON 2025**, organized by the School of Health & Medical Sciences, Adamas University, Kolkata. This two-day hybrid event brings together healthcare professionals, researchers, and thought leaders from across the globe to share their knowledge, innovations, and advancements in healthcare research and development.

HEALTHMEDICON 2025 is more than just a conference, it is a platform for collaboration and inspiration. With an exciting lineup of keynote speeches, interactive sessions, and insightful oral and poster presentations, the event aims to bridge gaps and foster transformative ideas in healthcare and medicine. We are delighted by the overwhelming response from participants, which reflects the global community's dedication to advancing healthcare solutions.

I extend a warm welcome to all attendees and encourage everyone to actively engage, explore, and learn. Such gatherings are crucial for nurturing knowledge exchange and building networks that drive progress in the field.

I express my heartfelt gratitude to the respected Chancellor, Vice Chancellor, Registrar, and the entire team of Adamas University for their constant encouragement. Special thanks to our sponsors for their invaluable support in making this event possible. I also deeply appreciate the tireless efforts of the organizing committee, whose dedication has brought HEALTHMEDICON 2025 to life.

Beyond the academic sessions, I hope all participants will take a moment to experience the serene beauty of the Adamas University campus and the cultural richness of Kolkata.

Wishing HEALTHMEDICON 2025 immense success and a lasting impact on the healthcare community!

Warm regards,

A handwritten signature in black ink that reads "Anirbandep Bose".

Dr. Anirbandep Bose
Co-Convenor, HEALTHMEDICON 2025,
Associate Professor, Department of Pharmaceutical Technology,
School of Health & Medical Sciences
Adamas University, Kolakata-700126

PATRON



Prof. (Dr.) Samit Ray
Founder and Chancellor, Adamas University,
Kolkata, West Bengal – 700126, India

CO-PATRON



Prof. Suranjan Das
Vice Chancellor, Adamas University,
Kolkata, West Bengal – 700126, India

CHAIRMAN



Prof. (Dr.) Rudra Prasad Saha
Dean, School of Health and Medical Sciences,
Adamas University, Kolkata, India.

ORGANIZING SECRETARY



Dr. Suvendu Kumar Sahoo
Associate Professor & HOD,
Department of Pharmaceutical Technology,
School of Health and Medical Sciences,
Adamas University, Kolkata, India.



Mr. Pablo Chandra
Assistant Professor & Teacher in Charge,
Department of Allied Health Science,
School of Health and Medical Sciences,
Adamas University, Kolkata, India.

ADVISORY COMMITTEE MEMBERS



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Dean, School of Health and Medical Sciences, Adamas University, Kolkata



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SoHMS, Adamas University,



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& Vice President, APTI, West



Mr. Somsubhra Ghosh

Associate Professor
School of Pharmacy,
The Neotia University,
Diamond Harbour, West Bengal

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- Mr. Rajdip Goswami

VOLUNTEERS

- Suraj Mallick (Coordinator)

Name	Role	Name	Role	Name	Role
Amandeep Debnath	Floor	Abhijit Sarkar	Registration	Reeklina Sadhuhan	Stage
Isha Datta	Floor	Himadri Mondal	Registration	Supriya Saha	Stage
Arnab Mondal	Floor	Aniruddha Sarkar	Registration	Susajjita Pahari	Stage
Souradeep Saha	Floor	Arghyadip Biswas	Registration	Pritha Das	Stage
Abhijan Pradhan	Floor	Sayan Bera	Registration	Anubhab saha	Stage
Subham Santra	Floor	Debraj Roy	Registration	Bimbita Kar	Stage
Kishanu Biswas	Floor	Sagnick Dey	Registration	Srijeeta Adhikary	Stage
Anupam Maity	Floor	Adrita Karmakar	Registration	Sushmita Biswas	Stage
Sandeep Kr Ghorai	Floor	Diya Patel	Registration	Dipayan De	Stage
Kuntal Mondal	Floor	Sharon Bose	Registration	Jinal Patel	Stage
Pratyush Dutta	Floor	Simone Sadhukhan	Registration	Arundhuti Chatterjee	Stage
Arya Kundu	Floor	Suprita Sarkar	Registration	Soumyodeep Roy	Stage
Soham Chatterjee	Floor	Manasi Pradhan	Registration	Rimi Goswami	Stage
Srinjoy Ghosh	Floor	Ishani Dutta	Registration	Sushmita Pahari	Stage
Shrestha Nandi	Floor	Shreya Chanda	Registration	Pritha Maitra	Stage
Shreya Parira	Floor	Shreya De	Registration	Sagarika Saha	Stage
Anwesha Chakraborty	Floor	Aman Mandal	Registration	Amartya Sen	Stage
Rituja Bose	Floor	Mukulika Bishya	Registration	Tanmay Nath	Stage
Naim Ahmed Khatoon	Floor	Archismita Roy	Registration	Anjishnu Dhar	Stage
Archita Sarkar	Floor	Sharmila Das	Registration	Sourav Das	Stage
Nitesh Chowdhury	Floor	Sayan Biswas	Scientific	Subhrajyoti Thakur	Stage
Rahul Kr Bhagat	Food	Sayan Sarkar	Scientific	Poulami Manna	Stage
Suvrjit Chakraborty	Food	Suhas Das	Scientific	Smriti Kona	Stage
Sachitra Saha	Food	Sk Koushik Adib	Scientific	Singha	
Md Asifuzzaman	Food	Samanway Chowdhury	Scientific	Propanna De	Stage
				Suman Dhauria	Stage
Shreyas Pramanik	Food	Saujanya Paul	Scientific	Dipayan Golder	Photography
Mobassar Ahmad	Food	Bipasa saha	Scientific	Sujan Pal	Photography
Rupam Mondal	Food	Sahasrabdi Majhi	Scientific	Pradipta Kundu	Photography
Arijit Chatterjee	Food	Rifaj Sarkar	Scientific	Sudipta Kundu	Photography
Arunanghshu Maity	Food	Priyasa Dutta	Scientific	Uday Shankar Das	Scientific
Saheli Mondal	Food	Chayan Kundu	Scientific	Sushangkar Dey	Scientific
Amrita Nandi	Food	Arnab Nandi	Scientific	Shubham Kumar	Scientific
Prapan Roy	Food	Anujit Saha	Scientific	Anisha Das	Scientific
Debankan Senapati	Food	Md. Akbar	Scientific	Sampriti Bera	Scientific



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QS WORLD UNIVERSITY RANKINGS



4th International Conference HEALTHMEDICON 2025 on “Unveiling Opportunities in India’s Healthcare Landscape” Scientific Advancements, Innovations, & Recent Trends” In collaboration with University Teknologi, MARA (UiTM), Malaysia.

PROGRAMME SCHEDULE HEALTHMEDICON 2025, [30 th - 31 st January, 2025]			
SL.NO.	DAY 1	TIME	PROGRAMME FLOW
1	30/1/25	10:00 - 10:04 AM	Opening by Master of Ceremony & Welcoming Guests
2		10:04 - 10:08 AM	Lamp Lighting Ceremony
3		10:08 - 10:12 AM	Inaugural Song
4		10:12 - 10:16 AM	Inaugural Dance
5		10:16 - 10:18 AM	Opening Ceremony by Honourable Chancellor, Prof. (Dr.) Samit Ray, along with the Felicitation of Chief Guest, Prof. (Dr.) U S N Murty, by Honourable Chancellor
6		10:18 - 10:20 AM	Felicitation of Guest of Honor, Prof. (Dr.) Wong Ting Hui, by Honourable Vice Chancellor, Prof. (Dr.) Suranjan Das
7		10:20 - 10:22 AM	Felicitation of Honourable Chancellor by the Dean, SoHMS, Prof. Dr. Rudra Prasad Saha
8		10:22 - 10:24 AM	Felicitation of Honourable Vice-Chancellor by the Dean, SoHMS
9		10:24 - 10:26 AM	Felicitation of the Dean, SoHMS, by the Convenor
10		10:26 - 10:31 AM	Welcome address by the Honourable Chancellor
11		10:31 - 10:36 AM	Address by the Honourable Vice-Chancellor
12		10:36 - 10:40 AM	Address by the Convenor, Prof. (Dr.) Biswajit Basu
13		10:40 - 10:45 AM	Keynote Address by Chief Guest, Prof. (Dr.) U S N Murty, Director, National Institute of Pharmaceutical Education and Research (NIPER)-Guwahati & Kolkata, India.
14		10:45 - 10:50 AM	Address by Guest of Honor, Prof. (Dr.) Wong Ting Hui, Professor, Department of Pharmacy, MARA - Malaysia.
15		10:50 - 10:55 AM	Address by Dean, SoHMS, Prof. (Dr.) Rudra Prasad Saha
16		10:55 - 10:58 AM	Unveiling the Abstract Book by the Dignitaries
17		10:58 - 11:00 AM	Vote of Thanks, by Associate Dean, DoPT, Prof. (Dr.) Sanjay Dey
18		11:00 - 11:20 AM	Tea Break
SCIENTIFIC SESSIONS			
19		11:21 - 12:06 PM	Keynote Session, Topic: The Next Frontier in Indian Healthcare: Evidence-based Traditional Medicinal Plants, Artificial Intelligence and Medical Devices, By the Chief Guest - Prof. (Dr.) U.S.N Murty, Director, National Institute of Pharmaceutical Education and Research (NIPER)-Guwahati & Kolkata, India
20		12:15 - 01:00 PM	Scientific Session I: Topic: Cancer Nanomedicine Development and Interdisciplinary Research Opportunities, By Prof. (Dr.) Wong Ting Hui, Professor, Department of Pharmacy, Universiti Teknologi, MARA - Malaysia
21		01:00 - 02:30 PM	Lunch
22		02:30 - 03:30 PM	Scientific Session II: Topic: Discovery, Pre-Clinical and Clinical Development of Synthetic Anti-VEGF FAB for Treating Wet-Macular Degeneration and Diabetic Retinopathy, By Dr. C. N. Ramchand, Director, Theragen Biologics: Perungudi, Chennai, Tamil Nadu

23		03:35 - 04:30 PM	Scientific Session III: Topic: Solid Lipid Nanoparticles: Transforming Drug Delivery for Better Healthcare, By Prof. (Dr.) Bhupendra G. Prajapati, Adjunct Professor, Faculty of Pharmacy, Silpa Korn University, Thailand & Professor. Dept. of Pharmaceutics and Pharmaceutical Technology. Shree S. K. Patel College Pharmaceutical Education & Research, Faculty of Pharmacy, Ganpat University, Gujarat, India
24		04:35 - 05:00 PM	Closing Address by Associate Dean, DoAHS, Dr. Joy Basu
25		05:00 PM Onwards	High Tea

SLNO.	Day 2	TIME	PROGRAMME FLOW
1	31/1/25	10:00 - 10:05 AM	Welcoming all the guests and Watering the Plants by the dignitaries
2		10:05 - 10:10 AM	Inauguration Song
3		10:10 - 10:15 AM	Address by Dr. Saptarshi Chatterjee, Associate Director: Incubation Industry-Academia Collaboration Lead Chief Coordinator & PI, E-YUVA Centre, Adamas University (Supported by BIRAC)
4		10:20 - 11:00 AM	SCIENTIFIC SESSIONS Keynote Session, Topic: Non-Steroidal Anti-Inflammatory Drugs (pain killers) Induce both Normal Gastric Mucosal and Cancer Cell Death Targeting Sirt3: Implication in Gastric Acid and Cancer, By Chief Guest, Prof. (Dr.) Uday Bandyopadhyay, Former Director, Bose Institute J.C Bose National Fellow -Bose Institute -Kolkata -West Bengal
5		11:00 - 11:20 AM	Tea Break
6		11:20 - 12:10 PM	Scientific Session IV: Topic: Functional Foods and Nutraceuticals in Health Promotion, By Prof. (Dr.) Debnath Chowdhury, Former Professor & Head, Department of Biochemistry & Nutrition, All India Institute of Hygiene and Public Health, Kolkata
7		12:10 - 12:40 PM	Scientific Session V: (Online) Topic: Manufacturing of Biologics in Bangladesh: Erythropoietin Biosimilar, By Prof. (Dr.) Sitesh Chandra Bachar, Pro-Vice Chancellor, University of Dhaka, Bangladesh
8		12:40 - 01:25 PM	Scientific Session VI: Topic: Impact of Low Vision and Visual Impairment on Vision Related Quality of Life, By Prof. (Dr.) Rituparna Ghosal, Professor, Department of Optometry, CT University, Punjab, India
9		01:30 - 02:30 PM	Lunch
10		02:30 - 03:30 PM	Scientific Session VII: Topic: Unlocking Vulnerabilities: Exploring Conditionally Essential Targets in Tuberculosis, By Prof. (Dr.) Venkatesan Jayaprakash, Professor, Department of Pharmaceutical Sciences & Technology, Birla Institute of Technology, Mesra, Ranchi
11		03:35 - 04:25 PM	Scientific Session VIII: Topic: Public Health and Global Health Challenges, By Dr. Prabal Mukherjee, Public Health Specialist, Technical Consultant, The World Bank, Kolkata, India.
12		04:30 - 05:00 PM	Scientific Session IX: (Online) Topic: Physics of Microwave Heating and Microwave Extraction of Functional Ingredients from Plants and Herbs,

			By Prof. (Dr.) Mudtorlep Nisoa, Professor, Walailak University, Nakhon, Thammarat, Thailand
13		05:00 - 05:25 PM	Valedictory Session (Closing Dance, Prize Distribution Ceremony)
14		05:25 - 05:30 PM	Vote of thanks by Co-Convenor followed by the National Anthem
15		05:30 PM Onwards	High Tea

Details of Scientific Presentation:

Sl. No.	DATE	EVENTS	MODE OF CONDUCT	POSTER ABSTRACT ID.	TIME
1	30/01/2025	Poster	OFFLINE	PP01-PP120	[2:30 PM – 5:00 PM]
2	30/01/2025	Oral	OFFLINE	OP01-Rest	[2:30 PM – 5:00 PM]
3	30/01/2025	Oral	ONLINE	EOP01-Rest	[2:30 PM – 5:00 PM]
4	31/01/2025	Poster	OFFLINE	PP121-Rest	[10:00 AM – 1:30 PM]
5	31/01/2025	Poster	ONLINE	EPP01-Rest	[10:00 AM – 1:30 PM]

KEYNOTE SPEAKERS



PROF. USN MURTY

Director

National Institute of Pharmaceutical
Education and Research (NIPER),
Guwahati & Kolkata, India

Prof USN Murty, Director of NIPER Guwahati and NIPER -Kolkata, Department of Pharmaceuticals Ministry of Chemicals and Fertilizers, Govt of India. Dr Murty is also serving at present the chairman, BIO-NEST (BIRAC, DBT Govt of India), Chairman AIC NIPER-Guwahati Foundation (AIN, NITI Aayog, Govt of India), Chairman, Research Council (CSIR-NEIST), Jorhat, Assam, Member of Turmeric Board, Govt of India.

Prof Murty also served as former member CSIR, Advisory board, former Chief Scientist CSIR -IICT, Hyderabad, Former Director (Additional) of both NIPER S.A. S Nagar, and NIPER Raebareli). Prof USN Murty obtained his PhD degree from the Osmania University of Hyderabad in 1990.

His prime research area includes mainly public health, epidemiology, rural development. Dr Murty is a dynamic and visionary leader in the field of Pharmaceuticals, Public Health, innovations.

Prof Murty had achieved numerous awards such as World Health Organization and Tropical Disease Research, Geneva fellowship, USA (1992); ‘Best Project performance’ by Government of Mizoram for the project on Integrated Sericulture for Rural Development (2002); ‘Outstanding performance’ by Director, IICT for the project on SAMADHAN KENDRA (2004); German Research Foundation Fellowship, Germany (2005); ‘U.S. Defence award’ on “Window-on-science support” USA (2006); Best Project performance’ by Govt Arunachal Pradesh (2006); Sri Vege Venkata Krishna Rao & Smt.Vege Neelakanteswari Gold Medal in ABAP Patiala Punjab (2010).

Keynote Lecture

The Next Frontier in Indian Healthcare: Evidence-based Traditional Medicinal Plants, Artificial Intelligence, and Medical Devices

Dr. USN Murty

Director NIPER Guwahati & NIPER KOLKATA

Abstract

Ayurveda, an ancient traditional system, is widely practiced in India and around the world. India's healthcare landscape is undergoing a transformative shift, driven by rapid scientific advancements, innovative technologies, and evolving trends that collectively shape the future of healthcare delivery. With a population exceeding 1.4 billion, the nation faces unique challenges, including high disease burden, inadequate access to healthcare in rural areas, and rising healthcare costs. However, these challenges also present significant opportunities for growth and improvement in healthcare systems. Recent developments such as telemedicine, artificial intelligence (AI), biotechnology, and evidence-based complementary medicine are revolutionizing patient care, diagnostics, and treatment. Innovations in medical devices, digital health platforms, and genomics further drive efficiency and accessibility. In parallel, policy changes and government initiatives, such as the National Health Policy and the Ayushman Bharat scheme, address healthcare affordability and infrastructure gaps. This paper explores the current landscape of India's healthcare sector, examining key scientific advancements, technological innovations, and emerging trends that are reshaping the industry. Identifying

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**“Unveiling Opportunities in Global Healthcare Landscape:
Scientific Advancements, Innovations & Recent Trends”**

opportunities in these areas aims to highlight potential pathways for stakeholders—governments, healthcare providers, investors, and entrepreneurs—to contribute to a more inclusive and sustainable healthcare ecosystem in India.



PROF. (DR.) WONG TIN WUI

Professor

Department of Pharmacy

Universiti Teknologi MARA , Malaysia

Professor Dr Wong Tin Wui obtained his PhD degree from the National University of Singapore in 1999. He is presently the lecturer and principal fellow at the Faculty of Pharmacy and Smart Manufacturing Research Institute, Universiti Teknologi MARA. His research areas are primarily focused on precision oral, skin and pulmonary nanodrug delivery. He has published over 135 peer reviewed articles. He is the editorial board member of Asian Journal of Pharmaceutical Sciences, Associate Editor of Drug Development and Industrial Pharmacy, Drug Design, Development and Therapy, Frontiers in Pharmacology, Technology in Cancer Research and Treatment, and regional editor of Current Drug Delivery.

Professor Wong is the founder of Non-Destructive Biomedical and Pharmaceutical Research Centre, Malaysia and Sino-Malaysia Molecular Oncology and Traditional Chinese Medicine Delivery Joint Research Centre, Medical College, Yangzhou University, China. He is the jury for Maurice-Marie Janot Award and Lecture, and founder and chief jury for Malaysia Technology Expo Sustainable Development Goals International Innovation Awards. He serves as the visiting/adjunct/lecture professor of UCSI University, Taylor's University and Universiti Malaya, Malaysia; National University of Singapore; Yangzhou University, China; Nirma University, India; Silpakorn University, Thailand and is the fellow of Academy of Sciences Malaysia and postgraduate faculty member of Chulalongkorn University, Thailand.

Scientific Session – I

Cancer nanomedicine development and interdisciplinary research opportunities

Tin Wui Wong^{a,b*}

^aNon-Destructive Biomedical and Pharmaceutical Research Centre, Smart Manufacturing Research Institute, Universiti Teknologi MARA, 42300 Puncak Alam, Selangor, Malaysia

^bDepartment of Pharmaceutics, Faculty of Pharmacy, Universiti Teknologi MARA, 42300 Puncak Alam, Selangor, Malaysia
*wongtinwui@uitm.edu.my

Abstract

The personalised perspective of precision medicine involves patient's omics/healthcare assessment with therapy customized in accordance with the individual health status. More than one drug may be prescribed and delivered at variable doses and delivery kinetics to different target sites of action. As such, an ideal dosage form is preferably can be dispensed flexibly with the required drug dose. It is able to carry two or more drugs in a single dosage form, deliver the drugs with the desired kinetics, can possess same or different drug release kinetics, and may engage different drug-specific delivery

strategies. The dosage form ideally should be characterized by 100 % drug bioavailability. This presentation highlights the recent nano drug delivery innovations for skin, pulmonary and oral applications from the perspectives of material design, dosage form development, and technology device application to realize the true meaning of personalized therapy. Specifically, critical clinical gaps in cancer omics analysis for precision medicine development will be discussed with reference to nanomedicine design against the profiles of cancer cell target and metabolizing enzyme.



DR. C. N. RAMCHAND

Director - Theragen Biologics

No.153, 1st Main Rd, Industrial Estate,
Perungudi, Chennai, 600096, Tamil
Nadu, India

Dr CN Ramchand, a British Citizen, is currently the Co-founder ,CEO & CSO of MagGenome Technologies Pvt Ltd & MagGenome Inc., CEO of Saksin Inc./ Saksin Lifesciences Pvt Ltd., Director of Theragen Biologics Pvt Ltd, Theragen Lifesciences Pvt Ltd, and CEO of Theragen Molecular Innovations Pvt Ltd, Thejo Engineering Limited, Accel Transmatic Limited , Accel Limited , Accel Media Ventures Limited , Kerala Life science Park and Advisor to SciGenom Labs Pvt. Ltd, Cochin, Kerala, Sipwise Beverages, Chennai and Vadodara and also Visiting Professor and PhD guide, Swinburne University, Australia, Charotar University of Science & Technology, Gujarat and Visiting Professor at Slovak Academy of Sciences, Slovakia, Sumandeep Vidyapeeth, Gujarat and Acharya Nagarjuna University, Andhra Pradesh. Dr. Ramchand was the Director, at KEMIN Pharma, India (A subsidiary of Kemin Pharma Belgium BVBA) and was holding a simultaneous position as Director of Research and Development, Kemin Industries South Asia Pvt. Ltd., a part of Kemin Industries Inc, Des Moines, USA. Dr. Ramchand also was a WW executive team member at Kemin Industries. Prior to the assignment at Kemin Industries, Dr. Ramchand was with Sun Pharmaceuticals, currently the largest Pharma company in India (as per ORG Marg) as its Vice President and Head of Drug Discovery Research (Biological Research Programme) (1999-2004). He was closely involved in the setting up of a multimillion Drug Discovery centre including design and development of laboratories. Currently, Dr. Ramchand is an Honorary Visiting Scientist to European Nanotechnology consortium at University of Newcastle, UK. He is also an adjunct faculty, Visiting Scientist and PhD guide at Swinburne University of technology, Australia along with Prof. Ajay Kapoor.

Dr. Ramchand is a PhD in Biochemistry from MS University Baroda. He also served as Assistant Professor (1982-84) at MS University. He has also obtained his M Phil from the same university. He did his Bachelor's degree in Chemistry at S.D College, Alleppey from 1972 -75. He holds a Master's degree in Chemistry from the University of Kerala. He has also won the Young Scientist award from Charing Cross and Westminster Medical School, UK for 3 times, for the work in the role of membrane pathology in schizophrenia and the development of EPA as a therapy for schizophrenia. He has extensive experience in basic research activities, having handled prestigious projects in the US & UK, both Universities and in the Pharma Industry. Dr CN Ramchand is the recipient the recipient of the Kerala Academy of Sciences, honorary fellowship in the last 35 years only 18 top scientists only received this award and very first from industry. He has over 25 years of rich experience in the areas of

teaching, basic research, Drug discovery programme and disease mechanisms, guiding M Sc. / Ph D. students and setting up Research facility.

Scientific Session – II

Discovery, Preclinical and Clinical Development of Synthetic anti-VEGF FAB for Treating Wet-Macular Degeneration and Diabetic Retinopathy

Abstract:

Theragen Biologics Private Limited (TBL) is mainly focused on the discovery and development of FAB293, the potential drug candidate for Diabetic Retinopathy. Diabetic retinopathy is irreversible blood vessel damage in the retina that occurs due to diabetes and is the leading cause of visual impairment worldwide with a global prevalence of 2.1% (approx. 160 million). As there is increase in prevalence of diabetes mellitus, it is estimated that DR population would increase to 220 million by 2040. The molecule FAB293 is superior to existing drugs in terms of affinity and stability which could increase the responder population and decrease the frequency of injections. FAB293 would also be more affordable and reachable to wider population than the current drugs in the market.

The vision behind FAB293 development is to provide an efficacious and cost-effective treatment for DR patients. Currently approved anti-VEGF drugs like Lucentis and Eylea in the market are expensive and not widely accessible in India keeping in mind to meet the unmet medical needs and to provide affordable treatment to developing countries.

We have developed an anti-VEGF Fab molecule (FAB293) for DR, filed a US patent, successfully finished the discovery, proof of concept, development, pre-clinical toxicity studies and cGMP manufacturing for our proprietary molecule. FAB201, that is close to going to Phase-1 trials in US (IST trials) and India for wet AMD.

FAB293 is a 48kDa synthetic humanized anti-VEGF Fab (Fragment Antigen Binding). It is a novel biologic (has unique CDRs in light chain & heavy chain) expressed in microbial system (*E. coli* BL21). FAB293 has been developed using Phage display library with several rounds of affinity maturation for selection of clones with highest binding affinity, followed by site directed mutagenesis in CDRs for improved antigen binding towards hVEGF (Vascular Endothelial Growth Factor).

The fab molecule was engineered to express at a higher level and the downstream processing was optimised to minimise losses during purification. Developmental process of molecular biology where, gene coding for FAB293 was inserted in a modified pBR322 vector and has pho A promoter sequence. *E. coli* BL21 Pho based expression system offers an efficient and economic system to produce recombinant proteins. Bioreactor and scale-up cultivation was done up to 200L fermentation for the large-scale production of FAB201. The anti-VEGF FAB201 purifications and orthogonal analytical tests were performed. The recombinant protein was extracted from the cell before subjecting for purification, for which a series of steps are performed in sequence so as to efficiently extract the expressed protein from the cell and also maintaining the stability of the protein molecule at the same time inactivating or denaturing any unwanted process related impurities.

The Downstream Process for purification was optimised and was performed by a series of three chromatography steps to reduce impurities. Lysate was homogenized and clarified followed by

purification by series of column chromatography. The quality of the product from all three purification steps were assessed by various analytical techniques. The purified drug substance was formulated by buffer exchange & concentration of the drug substance with the formulation buffer. The accelerated stability and stress stability studies are confined to temperature stability studies at ambient temperature and 37°C, since FAB293 is a protein product. Bioanalytical studies included several assays like Quantitation, In-process impurities analysis.

Product related impurities and Sterility were performed. Biochemical & Biophysical characterization, analysis of batch consistency. In-vitro binding affinity, In-vitro efficacy study for batch release assay and In-vivo efficacy studies were performed.

MTD and preclinical studies were done as per the regulatory guidelines. cGMP material was generated for the clinical studies. US FDA IND filing was done, and the molecule is ready for Phase-1 clinical trial.



PROF. (DR.) BHUPENDRA G. PRAJAPATI

Professor, Dept. of Pharmaceutics and
Pharmaceutical Technology
Shree S. K. Patel College Pharmaceutical
Education & Research,
Ganpat University, Gujarat, India

Dr. Bhupendra G. Prajapati, Professor of Pharmaceutics at Shree S.K. Patel College of Pharmaceutical Education and Research, Ganpat University, India, and Adjunct Professor at Silpakorn University, Thailand, has over 23 years of academic and industrial expertise. He earned his Ph.D. from Hemchandracharya North Gujarat University and his M.Pharm and B.Pharm from M.S. University of Baroda. Recognized with awards like AICTE's Career Award and Ganpat University's President Award for Research Excellence, Dr. Prajapati has published 200+ research papers, edited 20 international books, contributed 150+ chapters, and holds two patents in novel drug delivery systems. An active researcher in lipid-based drug delivery and nanotechnology, he has guided 14 Ph.D. and 55 postgraduate scholars. A Fellow of the Royal Society of Chemistry, he is also a member of several prestigious professional organizations worldwide.

Scientific Session – III

Solid Lipid Nanoparticles: Transforming Drug Delivery for Better Healthcare.

Abstract

Solid lipid nanoparticles (SLNs) represent an innovative advancement in drug delivery systems, offering a versatile, biocompatible, and biodegradable platform for improving therapeutic outcomes. Composed of solid lipids dispersed in water and stabilized by surfactants, SLNs address several limitations of conventional drug delivery methods. They provide enhanced stability for drugs, protecting them from degradation and enabling controlled and sustained release, which is especially beneficial for sensitive therapeutic agents such as paclitaxel, curcumin, and insulin. This stability not only improves the efficacy of drugs but also

minimizes the frequency of administration, enhancing patient compliance. SLNs are particularly advantageous in improving drug bioavailability, as they enhance the solubility and permeability of drugs like clotrimazole, zidovudine, and doxorubicin. These nanoparticles can carry both hydrophilic and lipophilic drugs, making them suitable for a wide range of therapeutic applications, including cancer, skin disease, diabetes, neurological disorders, infectious diseases etc. For instance, paclitaxel-loaded SLNs have shown promising results in cancer therapy by improving the drug's pharmacokinetics and reducing its side effects. Similarly, insulin-loaded SLNs have demonstrated potential in achieving sustained release for diabetes management. The preparation of SLNs involves advanced techniques such as high-pressure homogenization, microemulsion, and solvent evaporation, ensuring uniform particle size, spherical morphology, and optimal zeta potential, which are critical for stability and effectiveness. Characterization techniques like scanning electron microscopy, differential scanning calorimetry, and photon correlation spectroscopy are employed to assess their physical and chemical properties. Despite their numerous advantages, SLNs face challenges such as scaling up production, optimizing formulations, and ensuring consistent drug release profiles. However, ongoing research and technological advancements are working to overcome these hurdles, paving the way for broader applications of SLNs in targeted drug delivery, personalized medicine, and the treatment of complex diseases. The future of SLNs looks promising, with their potential to transform healthcare by offering safer, more effective therapies and improving outcomes for patients across various medical fields.



DR. UDAY BANDYOPADHYAY

Former Director & J.C. Bose National Fellow
Bose Institute, Kolkata,
West Bengal, India

Uday Bandyopadhyay obtained Post-graduate Degree in Human Physiology from Calcutta University, Kolkata. And after obtaining PhD (1994) from Jadavpur University in the area of gastric pathophysiology and cell biology. he worked as a Post-doctoral Research Fellow (1995-96) with Professor R Barouki, INSERM-U 99, Paris, France, studying the regulation of aspartate aminotransferase gene expression in hepatoma cells. Next, he worked as a Post-doctoral Research Fellow (1996-97) with Professor Andreas H Guse in the Department of Physiological Chemistry, University of Hamburg, Germany, studying inositol pentakisphosphate metabolizing enzyme as well as regulation of Ca^{2+} signaling in T-lymphocytes. On return to India, he joined CSIR-Central Drug Research Institute, Lucknow as faculty of the department of Biochemistry (2002-2006). In 2006, he joined CSIR-Indian Institute of Chemical Biology, Kolkata in the department of infectious diseases and immunology as a senior faculty. After that he served as Director of Bose Institute (April 2019 – May 2, 2024). Dr Bandyopadhyay's research focused in the area of cell biology with particular reference to mitochondrial oxidative stress in relation to initiation of gastric ulcer/gastropathy by commonly prescribed non-steroidal anti-inflammatory drug (NSAIDs). He also made a remarkable contribution in the field of malaria. He has published over 87 research articles and bagged several Indian, USA, European and Japanese patents. Dr Bandyopadhyay is a recipient of Humboldt Fellowship (Alexander Von Humboldt Foundation, Germany, 1996), Professor R. C. Shah Memorial Award (96th Indian Science

Congress, 2009), Professor A. N. Bhaduri Memorial Award (Society of Biological Chemist (India), 2012) and J. C. Bose National Fellowship (Department of Science and Technology, 2015, 2024). He is a Fellow of the National Academy of Sciences (India), Allahabad, Fellow of Indian Academy of Sciences, Bangalore, Fellow of Indian National Science Academy, New Delhi and Fellow of West Bengal Academy of Science and Technology, Kolkata.

Keynote Session

Non-steroidal anti-inflammatory drugs (pain killers) induce both normal gastric mucosal and cancer cell death targeting Sirt3: Implication in gastric ulcer and cancer

Uday Bandyopadhyay

Division of Biological Sciences, Bose Institute, EN 80, Sector V, Salt Lake, Kolkata-700091,
West Bengal, India

Abstract

Non-steroidal anti-inflammatory drugs (NSAIDs) are most commonly used drug to treat pain and inflammation. But they induce cell death in gastric mucosa leading to gastric injury/ulcer as a major side effect. The mechanism of this cytotoxicity is not yet clear because of its multiple extra-COX effects. Our studies identified Sirt3 as a key player in indomethacin-induced gastric mucosal cell death and gastric mucosal injury after transcriptome analysis. Indomethacin down-regulated Sirt3 expression and its deacetylase activity. Sirt3 down-regulation resulted in hyperacetylation of mitochondrial proteins, damage of mtDNA, downregulation of ETC complex genes, fragmentation of mitochondria, aberrant mitophagy and ultimately cell death. Indomethacin-induced cytotoxicity in mucosal cells was aggravated when Sirt3 was silenced and stimulation of Sirt3 by honokiol prevented indomethacin-induced rat gastric mucosal transcriptome alteration, mitochondrial pathology, apoptosis and concurrent inflammatory tissue damage. Sirt3 inhibition is common to popular NSAIDs like ibuprofen, diclofenac, and aspirin. Thus, NSAIDs by targeting sirtuin-3 as a common cytotoxic response offer gastric mucosal normal cells death to trigger mucosal injury and induce gastric cancer cell death.



PROF. (DR.) DEBNATH CHAUDHURI

Former Professor & Head
Department of Biochemistry & Nutrition,
All India Institute of Hygiene and Public Health,
Kolkata

Dr. Debnath Chaudhuri, former Professor and Head of the Department of Biochemistry & Nutrition at the All-India Institute of Hygiene and Public Health, Kolkata, holds an M.Sc. and Ph.D. in Biochemistry from Calcutta University. With an illustrious career in academia and research, his work has spanned diverse fields, including developmental biochemistry, metabolic syndrome, geriatric and pediatric nutrition, and vitamin D.

Dr. Chaudhuri has published over 60 peer-reviewed articles and successfully supervised five Ph.D. scholars, making significant contributions to the field of biochemistry and nutrition. A Fellow of both the Indian Public Health Association and the International College of Nutrition,

he was honored with the prestigious Rastogi Felicitation Award for his outstanding contributions to nutrition science.

His expertise has been instrumental in shaping national programs on micronutrient malnutrition, food safety, and the nutrition of indigenous populations, where he served as a key resource person. Additionally, Dr. Chaudhuri has held esteemed editorial roles, including serving as Editor-in-Chief of the Journal of the Indian Dietetic Association.

Dr. Chaudhuri has also contributed extensively to academic development, serving as a course writer for the Indira Gandhi National Open University (IGNOU) and as a member of the National Advisory Committee of the Nestlé Nutrition Institute.

With a distinguished career dedicated to advancing nutrition and public health, Dr. Chaudhuri's contributions have left a lasting impact on the field, both nationally and internationally.

Scientific Session – IV

Functional foods and Nutraceuticals in Health Promotion



PROF. (DR.) SITESH CHANDRA BACHAR

Pro Vice Chancellor (Academic)
University of Dhaka, Bangladesh

Dr. Sitesh C Bachar is serving as a Professor in the Department of Pharmacy, University of Dhaka, Bangladesh. He joined in the Department of Pharmacy, Faculty of Pharmacy as a Lecturer in 1997. He also served as Pro-Vice Chancellor and Dean of the Faculty of Pharmacy, University of Dhaka. Before joining the Department of Pharmacy, he received his B.Pharm (Hons) and M.Pharm degrees from the University of Dhaka with the credential. Professor Bachar was awarded a Ph.D. in Pharmacy from Jadavpur University, Kolkata 700 032, West Bengal, India in 1996.

Dr. Bachar is a well-recognized medicinal chemist with particular expertise in synthesizing indan-based anti-inflammatory, analgesic, plant growth regulatory compounds, and structure-activity studies. He is an outstanding medicinal chemist with a pharmacy educational background. He also possesses unique expertise in the isolation, purification, and pharmacological evaluation of Bangladeshi traditional and herbal medicines and their quality. Professor Bachar has been successful in securing several research grants to support his research. He is an innovative researcher as well as an accomplished teacher in the higher education sector. He has a keen and objective-driven approach to whatever he does. As an academician and experienced in hospital and clinical pharmacy practice and management Dr. Bachar has established clinical and hospital pharmacy practices in Bangladesh, actively participated in the implementation of pharmacovigilance (adverse drug reaction monitoring) activities in the country, and

engaged in the reduction of antimicrobial resistance (AMR) in the community due to inappropriate use of antibiotics as a member of a national technical committee.

He participated as a pharmaceutical expert in the inspection of pharmaceutical industries during 2009 to 2014 to ensure good manufacturing practice (GMP) and quality of medicines in the country as a parliamentary body member under the Ministry of Health and Family Welfare, GOB following paracetamol tragedy on 2008. Prof. Bachar contributed to preparing test criteria for Unani and Ayurvedic medicines for setting in the industry to ensure the quality of traditional medicines in the country. He was an executive editor and assistant editor of the fifth (2019) and fourth editions (2015) of the Bangladesh National Formulary (BDNF), respectively. At present actively contributing to the Emergency Use Authorization of medicines, vaccines, and related medical devices during the pandemic situation as a member.

Experience more than 35 years in research and education, Dr. Bachar has had the opportunity to publish several publications in high-impact international journals in the area of clinical, medicinal, and natural products chemistry. His research works have been published in several national and international reputed peer reviewed journals. His total number of publications is more than **140**. Research articles are **130** and **10** book chapters. Over the years, Prof Bachar has shown his ability to sustain high-quality research activities, excellent academic profile, and many collaborative skills. His teamwork and motivating ability are evident in his research, engaging several collaborators from various research groups from home and abroad. He also has journal editorial advisory memberships, grant reviewing, and journal article reviewing expertise in various high-impact international journals. As a Dean of the Faculty of Pharmacy, he is one of the Associate Editor-in-Chiefs of ‘The Dhaka University Journal of Pharmaceutical Sciences (DUJPS).

Dr. Bachar is actively involved in clinical research for the development of an mRNA vaccine candidate in Bangladesh developed by Globe Biotech Ltd, Bangladesh, and also conducting bioequivalence studies of Bangladeshi generic products (small molecules and biosimilars) at home and abroad. Working for finding a new target drug / vaccine against Dengue virus.

Dr. Bachar was the Organizing Secretary of the first-ever International Conference on Ethnopharmacology and Ethnomedicines (ISE-SFEC 2018) held in Bangladesh on January 13-15, 2018, in association with the International Society for Ethnopharmacology (Switzerland) and Society for Ethnopharmacology India. He was also the conference chair of many national and international conferences held at home and abroad for the last 25 years.

Scientific Session – V

Manufacturing of Biologics in Bangladesh: Erythropoietin biosimilar

Sitesh Chandra Bachar¹

Abstract

The biosimilarity between the laboratory-developed test candidate GBPD002 and the comparator Eprex® for erythropoietin (EPO) functioning has been assessed by contrasting their pharmacokinetic (PK) and pharmacodynamic (PD) characteristics after subcutaneous injection. This was a two-sequence, crossover clinical trial that was double-blinded and randomized. After a 4-week washout period, the subjects were randomly randomized to receive either the alternative formulations or a dose (4,000 IU)

of the test or comparator EPO. The serum EPO concentrations from blood samples were used to determine the PK parameters, which were shown to be comparable for both formulations. These parameters are the maximum observed concentration (C_{max}) and the area under the curve extrapolated to infinity (AUC_{0-inf}). Within the regulatory range of 0.80 – 1.25, the geometric mean ratios (at 90% CI) of the C_{max} and AUC^{inf} were 0.89 and 1.16, respectively. The PD indicators (reticulocyte, haematocrit, haemoglobin, and red blood cell) and time-matched serum EPO concentrations showed an anticlockwise hysteresis, indicating a lag between the observed concentration and the reaction. The effectors' ANOVA-derived P-values (>0.05) amply demonstrated how similarly the test and comparator medicines' effects on PD indicators differed from one another. Anti-drug antibodies were not detected, and both formulations were reported to be well tolerated. It is anticipated that the two formulations will be utilized interchangeably in clinical settings.



PROF. (DR.) RITUPARNA GHOSHAL

Professor

Department of Optometry
CT University, Punjab, India

Dr. Rituparna Ghoshal, a PhD from National University of Malaysia has started her carrier as a consultant optometrist at Meera and L B Deshpande Centre for Sight Enhancement, L V Prasad Eye Institute, Hyderabad, India in the year 2007. Over the years she has gathered extensive experience and expertise in managing patients with low vision. Besides, she has been actively involved in academics and vision researches. She has over 15 years of experience in patient care, teaching, training and vision researches in India and Malaysia. She has published her research works in various international peer reviewed journals. She has delivered several scientific and research presentations at national and international platforms. Her research and clinical interest lie in low vision rehabilitation, quality of life among visually impaired and visual and morphological markers of age-related macular degeneration. At present, she is associated with Department of Optometry, CT University, Punjab as a Professor.

Scientific Session – VI

Impact of low vision and visual impairment on vision related quality of life

Abstract

Vision loss may negatively impact individual's overall vision related quality of life (VRQoL) including different domains such as functional, social, psychological and economic well-being. These domains of VRQoL get affected one after the other and are often inter-related with a bi-directional approach. Similarly, many factors such as type and degree of vision loss, family reactions and support, self-concept/ personality, individual's expectations, educational attainment, social support and board cultural attitudes, significant life events may contribute to the extent of the impact of vision loss on VRQoL. Nevertheless, eye care professionals often overlook these domains, focusing only on clinical parameters

or at the most functional difficulties. Various subjective tools such as NEIVFQ-25, IVI, VF-14, LVQOL, IVFQ and many more are available to measures VRQoL and its different domains. These tools can be easily adopted in clinical setting for a comprehensive evaluation of the impact of vision loss. Understanding and addressing these impacts on VRQoL of an individual with visual impairment is of utmost importance in a low vision rehabilitation set up and can further be considered as the key to a successful rehabilitation of visually impaired.



PROF. (DR.) VENKATESAN JAYAPRAKASH

Professor

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Dr. Venkatesan Jayaprakash is a distinguished professor in the Department of Pharmaceutical Sciences & Technology at Birla Institute of Technology, Mesra, Ranchi, India. He holds an M.Pharm. and Ph.D. in Pharmaceutical Sciences and has an extensive teaching career spanning 24 years, with 20 years of active research experience. His professional journey includes serving as a Professor (2021–present), Associate Professor (2016–2021), Assistant Professor (2007–2016), and Lecturer (2004–2007) at BIT Mesra. Prior to this, he worked as an Assistant Professor at Sanjivani College of Pharmaceutical Sciences, Rajasthan (2002–2004), and JKMMRF College of Pharmacy, Tamil Nadu (1999–2002), where he also served as a Tutor (1996–1997).

Dr. Jayaprakash specializes in organic synthesis, medicinal chemistry, molecular modeling, and drug design. His research focuses on developing antitubercular agents targeting mycobactin biosynthesis, CNS-active monoamine oxidase inhibitors, anticancer agents such as HDAC, RR, CDK, and CYP inhibitors, as well as antiviral agents including protease inhibitors for Dengue and Chikungunya viruses. His contributions have been recognized through awards and a travel grant from the Department of Biotechnology, Government of India (2015), for an international symposium in Turkey. He has served as PI and Co-PI in various projects received from DST-SERB, RPS-AICTE, DBT and UGC. His research primarily focuses on the development of novel inhibitors targeting various diseases, including tuberculosis, cancer, and viral infections. His work has been widely recognized, with over 2,971 citations, demonstrating its impact in the field. He has published extensively in reputed journals such as *Bioorganic chemistry*, *Medicinal Chemistry Letters*, *European Journal of Medicinal Chemistry*, *RSC Advances*, *Journal of Enzyme Inhibition and Journal of Medicinal Chemistry*. He has successfully guided 7 PhD scholars and many M.Pharm students. Through his extensive research and mentorship, he continues to shape the future of pharmaceutical sciences.

Scientific Session – VII

Unlocking Vulnerabilities: Exploring Conditionally Essential Targets in Tuberculosis

Dr.Venkatesan Jyaprakash
Professor, Birla Institute of Technology, Mesra, Ranchi, Jharkhand

Abstract

Tuberculosis (TB), caused by *Mycobacterium tuberculosis* (Mtb), remains a pressing global health challenge, further exacerbated by the rise of multidrug-resistant strains. Iron acquisition is critical for Mtb survival and virulence, particularly under host-imposed iron stress. The mycobactin biosynthesis pathway, essential for iron uptake, represents a promising therapeutic target. Among its key enzymes, MbtB (phenyloxazoline synthase) plays a central role in catalyzing the condensation and cyclization reactions essential for mycobactin production.

In the absence of an experimentally resolved protein structure, we adopted a rational design approach to develop hydroxyphenyloxazoline mimics. These compounds were designed based on the transition state structure during heterocyclic ring formation mediated by the condensation/cyclization domain of MbtB. The designed ligands were synthesized and evaluated for their ability to inhibit the growth of *Mycobacterium tuberculosis* in Fe-rich and Fe-deprived medium. Preliminary *in vitro* assays demonstrated that these hydroxyphenyloxazoline mimics disrupt mycobactin biosynthesis, impairing iron acquisition and inhibiting bacterial growth under iron-limited conditions.

This study highlights the potential of targeting MbtB to exploit a critical vulnerability in Mtb's iron acquisition machinery. By leveraging transition state-based design, we provide a promising starting point for the development of novel therapeutics against TB, particularly for drug-resistant strains. Our findings underscore the importance of iron stress adaptation in TB pathogenesis and establish MbtB as a viable target for future anti-TB drug development.



DR. PRABAL MUKHERJEE
Public Health Specialist
Technical Consultant
The World Bank, Kolkata, India

Prabal Mukherjee is a seasoned public health professional & practitioner with over a decade of experience in health systems strengthening and program implementation. He holds a degree in Pharmacy and later specialized in Public Health and Epidemiology from the Institute of Health Management & Research (IHMR) University, Jaipur, in collaboration with Johns Hopkins University. He is also pursuing his PhD on cervical cancer and HPV vaccines at the Jodhpur School of Public Health.

Currently, Prabal serves as a Public Health Consultant with the World Bank Group in India, focusing on strengthening health system reforms.

Prabal began his public health career with the National Health Mission (NHM), Government of Gujarat, as a District Program Manager. After 1.5 years, he joined UNICEF as a Maternal and Child Health Consultant, serving for over 2.5 years across various districts in Assam. During this time, he successfully rolled out new vaccines, including the Measles-Rubella vaccine under the Universal Immunization Program.

He then transitioned to the Routine Immunization Program Management Unit in Uttar Pradesh, supported by the Clinton Foundation, where he served as a State Policy and Planning Officer for Immunization. His notable contributions included supporting the implementation of COVID-19 vaccination in Uttar Pradesh and designing India's first data handlers training module for routine immunization programs.

Prabal later returned to his home state of West Bengal as a State Lead & Technical Officer with Jhpiego (an affiliate of Johns Hopkins University), supported by USAID. In collaboration with the Department of Health & Family Welfare, Government of West Bengal, he worked on strengthening the state's health system and enhancing pandemic preparedness. Notably, his efforts were instrumental in establishing West Bengal's first state-aided genome sequencing lab at the School of Tropical Medicine, Kolkata.

Over the past 1.5 years, Prabal has been associated with the World Bank as a Technical Consultant, spearheading comprehensive health system reforms in the state. In addition to his professional achievements, Prabal has contributed to academic literature, including chapters in books published by Cambridge Scholars Publishing. He also serves as a visiting faculty member at NSHM Health Science, mentoring Master of Public Health (MPH) students.

Scientific Session – VIII

Public Health and Global Health Challenges

Abstract

Public health plays a pivotal role in improving and safeguarding the health of communities through organised efforts, evidence-based policies, and strategic programs. Unlike clinical healthcare practitioners who focus on individual patient care, public health professionals address population-level health needs by emphasising disease prevention, health promotion, and tackling social determinants of health to achieve equitable outcomes.

This presentation will delve into the distinction between clinical healthcare and public health, exploring why greater emphasis should be placed on public health in terms of resource allocation, strategic planning, and implementation. It will clarify the roles and responsibilities of public health professionals, highlighting their contributions to creating resilient and sustainable health systems.

Key focus areas will include a discussion of current public health challenges, both in India and globally, such as emerging infectious diseases, non-communicable diseases, health inequities, and climate change. The presentation will outline major approaches to addressing these challenges, propose innovative and practical solutions, and underscore the importance of interdisciplinary collaboration in public health.

The session will conclude with insights on career pathways in public health, offering guidance for students and professionals aspiring to grow in this dynamic field. Drawing from personal experiences, the presentation will also share life lessons for navigating a successful transition from academia to a rewarding public health career.



PROF. DR. MUDTORLEP NISOA

Professor,
Walailak University,
Nakhon Thammarat, Thailand

Assoc. Prof. Dr. Mudtorlep Nisoa received a bachelor's degree in physics from Prince of Songkla University, Hat Yai Campus, M.Sc., and a Ph.D. in Plasma Physics from Nagoya University, Japan. He has been working on the physics of microwave heating, plasma production, and applications of microwave heating and plasmas since 2000. During the last 20 years, he has developed various microwave heating systems for drying, extraction, and chemical synthesis. He has published over 40 papers in journals and presented over 100 papers at conferences on microwave heating, microwave drying, microwave extraction, and plasma production.

Scientific Session – IX

Physics of Microwave Heating and Microwave Extraction of Functional Ingredients from Plants and Herbs

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Abstract

Microwave technology has revolutionized the field of natural product extraction due to its unique heating mechanisms and efficiency. This study explores the physics of microwave heating, focusing on its interaction with electromagnetic waves and materials, particularly bio-materials. Microwave heating offers selective and bulk heating capabilities, leveraging dielectric properties to convert electromagnetic energy into thermal energy effectively. The extraction of functional ingredients from plants and herbs benefits significantly from microwave-assisted techniques, providing higher efficiency and sustainability compared to conventional methods. This paper compares traditional extraction with microwave-assisted extraction, highlighting advancements in green extraction technologies. Applications include the extraction of secondary metabolites such as curcuminoids from turmeric, demonstrating the potential for scalable, industrial implementation. The findings emphasize the role of microwave technology in enhancing the value of natural products while fostering sustainable practices in agricultural and pharmaceutical industries.

**ABSTRACT
OF
ORAL PRESENTATION**

HEALTHMEDICON/25/OP-001

AZILSARTAN MEDOXOMIL LOADED THERMORESPONSIVE *IN SITU* NANOEMULGEL: AN APPROACH TO ATTENUATE DEMENTIA THROUGH NOSE-TO-BRAIN PATHWAYS

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Cognitive impairment and dementia have become a global burden, distressing millions of elderly, accounting for the progressive loss of neurons in the brain affecting multiple cortical centers. The renin-angiotensin system and its receptors, widely distributed within the brain, can treat dementia via diminishing oxidative radicle generation, neuronal inflammation, and increasing blood-brain barrier integrity. The present study delves into the formulation and optimization of thermoresponsive azilsartan medoxomil (AZL-M) loaded *in situ* nanoemulgel for targeted nose-to-brain delivery addressing the challenge of restricted entry of angiotensin receptor blockers (ARBs) to the brain due to low BBB permeability. Using a Box-Behnken design approach, the formulation components and mixing time were optimized for AZL-M nanoemulsion and incorporated into nanoemulgel followed by various characterization parameters. Among all the optimized gels, formulation F20 demonstrated superior characteristics for intranasal delivery exhibiting gelation at 33.4°C (nasal temperature), pH of 6.21 ± 0.35 , droplet size 160 ± 3.72 nm PDI of 0.210 ± 0.001 , and a zeta potential of -11.2 ± 0.85 mV, with suitable viscosity at both 15 °C and 37 °C. Also, F20 achieved $60.4 \pm 5.689\%$ cumulative drug release after 8h, along with the highest cumulative permeation (505 ± 55.15 µg/cm²) indicating the greater efficacy to permeate through the nasal mucosal cells. Safety studies confirmed biocompatibility and ROS reduction with enhanced SH-SY5Y cell viability. *In vivo* studies displayed improved cognitive functions along with increasing antioxidant enzyme activities (SOD, GSH, and Catalase), reducing malondialdehyde levels, and increasing neuronal count in the brain histopathological studies. Thus, the intranasally delivered AZL-M nanoemulgel emerges safe and effective therapy to treat dementia and related disorders.

Keywords: angiotensin receptor blockers; azilsartan medoxomil; *in situ* nanoemulgel; intranasal application; SH-SY5Y cell viability; neuroprotective potential

Ethical Statement: For the *in vivo* studies, animals were obtained from animal house at BIT Mesra, Ranchi approved by CCSEA and IAEC (1972/PH/BIT/84/24/IAEC).

HEALTHMEDICON/25/OP-002

TARGETED DRUG DELIVERY TO CD117-POSITIVE ACUTE MYELOID LEUKEMIA CELLS USING APTAMER-CONJUGATED NANOPARTICLES

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Acute Myeloid Leukemia (AML) poses significant challenges due to its high relapse rates, the systemic toxicity of conventional therapies, and the growing problem of drug resistance. To overcome these limitations, we have developed a novel targeted drug delivery system comprising aptamer-conjugated clofarabine-loaded PLGA nanoparticles (Apt-CNPs). This

system employs a single-stranded DNA aptamer that specifically binds to the CD117 biomarker, which is overexpressed on HL60 floating leukemia cells, enabling precise delivery of clofarabine to the target site. The experimental nanoparticles were synthesized using dual emulsion solvent evaporation method and characterized for particle size, zeta potential, and encapsulation efficiency. Successful conjugation of the aptamer to PLGA nanoparticles was validated through agarose gel electrophoresis, confirming a significant shift due to aptamer-nanoparticle linkage. Drug release studies demonstrated a sustained release profile, optimizing therapeutic efficacy while minimizing systemic exposure. In vitro cytotoxicity assays on leukemia cells including HL60, U937 and normal peripheral blood cells (PBMC) revealed enhanced uptake and increased apoptotic response in HL60 cells compared to the free drug. This targeted delivery platform not only improves drug localization at the cancer site but also reduces off-target effects, paving the way for an effective and safer treatment strategy for AML floating cells. The findings underscore the potential of aptamer-based nanoparticle systems as a versatile tool for precision medicine in leukemia treatment.

Keywords: Acute Myeloid Leukemia (AML), DNA aptamer, targeted delivery, nanoparticles, biomarker CD117.

HEALTHMEDICON/25/OP-003

OCULAR HEALTH AND VISUAL FUNCTION STATUS OF SEWING PROFESSIONALS IN MAHESHTALA, KOLKATA: A CROSS-SECTIONAL STUDY

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Occupational health risks among sewing professionals in garment industries are understudied, especially in low-resource settings like Maheshtala, Kolkata. A cross-sectional study has been carried out among 58 sewing professionals. Results revealed a high prevalence of ocular symptoms among the sewing professionals. 40% reported dryness, redness, or watering; 31% experienced eye strain during prolonged work; and 9% had difficulty with near-point vision. Studies also indicate the common workplace issues included poor lighting (78%), inadequate ventilation (64%), and poor seating arrangements (58%). Prolonged working hours exceeding eight hours, often with irregular breaks, further exacerbated these conditions contributing to refractive errors, accommodative dysfunctions, and dry eye syndrome, impacting productivity and quality of life. The study suggests practical and feasible measures to mitigate these issues by implementing ergonomic workstations, task-specific lighting, vision screenings, and regular visual rest periods to reduce ocular strain and improve occupational safety among sewing professionals. This study adhered to ethical standards and included only observational and non-invasive methods. Verbal informed consent was obtained from all participants. No personal identifiers were used in the analysis.

Keywords: Ocular morbidity, sewing professionals, workplace ergonomics, refractive errors, ergonomic solutions.

HEALTHMEDICON/25/OP-004

EXPLORING THE NUTRITIONAL AND THERAPEUTIC POTENTIAL OF THANKUNI JELLY

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Centella asiatica was used to devise a jelly without any preservatives while it is also a herb with high medicinal value and a rich source of polyphenols. It is crucial to establish the paraffin jelly's shelf-life, quality features, and polyphenol levels. The jelly will include solely the ingredients that served as bases. During the estimates of the shelf life while stored under optimal conditions, the jelly underwent rotting after 14 days, at that point color, texture and microbial growth were indications of spoilage. Furthermore, spectrophotometric analysis proved it to contain 197 GAE mg/100 g indicating high anti-oxidant capacity further supporting its high anti-oxidant potential. The findings indicate that the presence of polyphenols in jelly, which is obtained from Centella asiatica, is "very much" evident, while it also supports the notion that natural products with functional food properties are possible to construct. While the two-week limitation of the product remains in place, or if the new formulation is updated to eliminate certain complications, the bacteria forming has the potential to transform the food into a new product that lacks preservatives. Current trends of enhancement in the grass jelly market are bound to expand the storage and shelf-life of the Centella asiatica products.

Keywords: Centella asiatica jelly, Polyphenol content, Antioxidant capacity, Shelf-life assessment, Functional food development

HEALTHMEDICON/25/OP-005

FORMULATION OF A REVITALIZING HERBAL GEL ENRICHED WITH POWERFUL ANTIOXIDANTS

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Photoaging caused by UV rays can be commonly observed in today's world. Photoaging is caused by oxidative stress (free radical damage). The present study was aimed to formulate a gel cream that would revitalize and fight free radical damage to leave the skin hydrated and radiant. For this study, herbal ingredients were a preference to create something unconventional and unprecedented. The herbs used for this formulation is *Marticaria chamomila* (Family: Asteraceae), *Panax ginseng* (Family: Araliaceae), *Crocus sativus* (Family: Iridaceae) and *Salvia hispanica L.* (Family: Lamiaceae). For the fragrance of the gel cream, lavender oil was utilized. Niacinamide (5%) and Retinol (0.3%) are vitamins whose inclusivity would help in skin brightening and pigmentation. method was used for sample extraction. A statistical method called Design of Experiments was devised for the gel formulation. Antioxidant activity measurement like DPPH radical scavenging activity, hydrogen peroxide scavenging activity, superoxide radical scavenging activity, and reductive activities were performed. The absorbance of the samples procured from scavenging assays was measured. For the evaluation

of herbal gel, it's viscosity, washability, and spread ability is tested. Phytochemical tests of certain secondary metabolites were tested and confirmed. From this study, we concluded that the herbal gel was successfully formulated and evaluated exhibiting significant antioxidant and anti-inflammatory activity.

Keywords: Photoaging, Oxidative Stress, Free Radical Damage, Decoction, Retinol

HEALTHMEDICON/25/OP-006

DEVELOPMENT AND EVALUATION OF BIOPOLYMER FROM NATURAL SOURCE: A BOON TO PHARMACEUTICALS

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Green Pharmaceuticals are becoming more and more well-liked worldwide. Plant-based gums and mucilages are commonly used as main constituents in pharmaceutical formulations because of their affordability, wide accessibility, low toxicity, and high bioavailability. *Abelmoschus esculentus L.* is popularly known as okra or lady's finger. Okra mucilage was extracted using the maceration technique. The extraction yield was found to be substantially higher. The mucilage was assessed utilizing a variety of physicochemical characteristics such as viscosity, solubility, pH, and functional group analysis using FTIR spectroscopy. Qualitative analysis studies verified that the okra mucilage extract contained flavonoids, phenols, tannins, carbohydrates, and mucilage. The results showed that okra mucilage had potential functional features, such as high viscosity and great water-holding capacity. These qualities point to possible applications as a natural thickener, stabilizer, or emulsifier in the food, pharmaceutical, and cosmetic sectors.

Keywords- Okra mucilage, Qualitative Studies, FTIR Spectroscopy

HEALTHMEDICON/25/OP-007

PREPARATION OF MARIGOLD PETALS INCORPORATED PHIRNI AND SUBSEQUENTLY ANALYSIS OF ANTIOXIDANT, TEXTURE, MOISTURE, ASH, SENSORY, AND COST

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Phirni is a traditional creamy sweet starch pudding which is one of the most well-known traditional sweets enjoyed in North India, particularly during festivals and social gatherings. The study assessed the effect of incorporating marigold petal powder (MGPP) on several attributes of phirni. Sample A, B, C, D, and E contain 0.6g, 1.2g, 1.8g, 2.4g, and 3.0g of marigold petal powder, respectively. Increased ash content in Samples B, C, A, D, and E, as well as control, was 0.94%, 0.92%, 0.92%, 0.89%, 0.80%, and 0.62%, respectively, indicating that adding MGPP greatly increased the mineral content. The acidity and moisture content showed only slight changes, staying largely constant throughout all samples, suggesting that MGPP has little effect on these variables. Hardness (0.445 ± 0.021), gumminess (0.075 ± 0.021), and chewiness (0.07 ± 0.024) were all highest in the control sample. While adhesiveness was negative for every sample, suggesting resistance to sticking, springiness and cohesiveness was comparatively constant across all samples. Sample E, which contains the highest concentration of marigold petal powder, exhibited the most notable improvements with a TPC value of 412.627mg/g, TFC of 49.182mg/g, FRAP of 6.625 $\mu\text{mol/g}$, DPPH of 71.140% and ABTS of 89.494% than the others sample. The sensory test indicated that the addition of MGPP did not adversely affect the taste and aroma of the product. In conclusion, the incorporation of marigold petal powder substantially improves all profiles which is beneficial in incorporating the agent of Phirni.

Keywords: Phirni, Antioxidants, Biochemical, organoleptic, Cost.

HEALTHMEDICON/25/OP-008

NUTRITIONAL ANTHROPOMETRY AND HEALTH STATUS: A STUDY AMONG INDIGENOUS WOMEN OF NORTH 24 PARGANAS

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The body mass index (BMI) of tribal women from the Oraon community in North 24 Parganas, West Bengal, India, was used in a cross-sectional study to evaluate their anthropometric profile and nutritional status. The study included 117 participants above 11 years from a village in Uttar Chatra, North 24 Parganas District. Anthropometric measurements were recorded, including height, weight, circumferences, and skinfold thickness, along with BMI and waist-

hip ratio (WHR). The findings revealed a significant prevalence of underweight individuals ($BMI < 18.5$), with 15 participants in the 11–18 age group, 14 in the 19–39 age group, and 14 in the 40-year-old and above group. The normal weight category ($BMI 18.5\text{--}24.9$) showed a notable increase in frequency among individuals aged 19–39 years, with 41 participants, compared to 3 in the 11–18 age group and 25 in the 40-year-old and above group. The overweight category ($BMI 25.0\text{--}29.9$) was the least common, with only one participant in each of the 11–18 and 19–39 age groups, and five participants in the 40 years and above group. This study concluded that Oraon women, a tribal group in North 24 Parganas, West Bengal, had a high frequency of the dual burden of malnutrition (under nutrition and over nutrition). Malnutrition rates were significantly greater than those of a number of other Indian tribal communities, most likely as a result of urbanization and globalization. Hence, nutritional intervention programs should be implemented among tribal women immediately.

Keywords: Indigenous women, BMI, Malnutrition, Dual burden, Nutrition education

HEALTHMEDICON/25/OP-009

CARDIORESPIRATORY FITNESS LEVELS AMONG TRAINED & UNTRAINED DANCERS: A COMPARATIVE ANALYSIS

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Dancing offers substantial cardiovascular advantages, stimulating the heart in ways that enhance fitness and endurance. A fundamental aspect of comprehending the health benefits of dance lies in its impact on the cardiovascular system. Monitoring heart rate during dance sessions furnishes valuable insights into the body's cardiovascular efficiency. The purpose of this study is to investigate the differences in cardiac responses between trained and untrained dancers by assessing their resting heart rate, blood pressure, and oxygen saturation levels. This study included 70 participants aged 18–22 years, comprising 40 trained and 30 untrained dancers. A questionnaire assessed health and family medical history. Participants performed an Indian dance for 3.5 minutes. Resting and post-dance heart rate and blood pressure were measured using a "Dr Morepen BP-02" sphygmomanometer at 0, 1, and 3 minutes. Oxygen saturation was estimated using a nomogram with heart rate data. The Physical Fitness Index (PFI) was calculated using the Harvard Step Test formula. Data were analyzed using SPSS. The study found that untrained dancers experienced a significantly higher heart rate (126.6 ± 2.43) compared to trained dancers (112 ± 1.87). Additionally, diastolic blood pressure increased more substantially in untrained dancers (96.3 ± 2.71 mmHg) compared to trained dancers (88.4 ± 1.33 mmHg). A statistically significant difference was observed in maximum oxygen saturation ($VO_2 \text{ Max}$) between the two groups ($p<0.05$). These findings strongly suggest that trained dancers possess superior cardiovascular fitness and efficiency. The study highlights the significant impact of dance on cardiorespiratory responses, emphasizing its potential as an effective form of exercise.

Keywords: Cardiac response, Trained and untrained dancer.

HEALTHMEDICON/25/OP-010

PREVALENCE OF REFRACTIVE ERROR IN URBAN AND RURAL CHILDREN: A COMPARATIVE ANALYSIS

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Vision is crucial for a child's development. While rural life offers potential benefits, many children in rural areas lack access to quality eye care. This disparity in vision health between rural and urban populations can significantly impact their cognitive development, education, and overall well-being. This study primarily aimed to investigate the prevalence of refractive errors among school-aged children in urban and rural environments. In This cross-sectional study investigated 87 school students aged 3-12 years in rural and urban West Bengal. Visual acuity was assessed in all participants with and without correction using the Snellen chart. Refraction tests were conducted on children with visual acuity below 6/6. Retinoscopy was performed on all participants. Data were analysed using SPSS (v16.0), with unpaired t-tests for numerical data and chi-square tests for categorical data. Statistical significance was set at $p < 0.05$. The study included 87 children (mean age: 8.92 ± 2.13 years), with a slight female predominance (56.32%). The overall prevalence of refractive errors was 21.63%, higher in urban (23.87%) than rural areas (16.71%). Simple myopia was the most common, while astigmatism was the least. Notably, the prevalence of uncorrected refractive errors was higher among urban children. Myopia was the most prevalent refractive error, found to be more common in urban school children. Regular screening for refractive errors is crucial for all school-going children. Early detection of vision problems like near-sightedness, farsightedness, and astigmatism is vital for their academic success and overall well-being. In urban settings, where excessive screen time is common, raising awareness about responsible gadget usage is essential.

Keyword: Refractive error, Myopia, Prevalence, Retinoscopy

HEALTHMEDICON/25/OP-011

METAL CHELATION CAPACITY OF LUTEIN ESTERS IMPACTS GROWTH REGULATION OF GUT MICROBE: AN APPROACH TOWARDS NUTRITIONAL IMMUNITY

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All living organisms, including microbes require trace metals in their metabolic process and enzymatic activity for survival and growth. Nutritional immunity is a mechanism that uses limiting the availability of these free trace metals as a countermeasure against invading bacteria. The present work focuses specifically on this approach to limit the growth of gut pathogens using natural biochemicals that can reduce metal availability. Lutein ester, a xanthophyll carotenoid derivative, was solvent-extracted from dried marigold (*Tagetes* sp.) flower petal powder, and subjected to antioxidant assays viz., lipid peroxidation, iron reducing and metal chelating activity. Lutein ester was solubilized in DMSO and added to appropriate media for culturing *Escherichia coli* strain K-12 and *Lactobacillus acidophilus* strain LA-5, respectively to compare their growth in presence and in absence of lutein esters. Lutein ester

was found to be protective towards fish oil at a concentration of 400 ppm or more, when stored at 25–27°C. The effect is very similar to α -tocopherol at the concentration within 400–800 ppm. Interestingly lutein has shown to reduce the growth of commensal strain of *Escherichia coli* strain K-12 significantly ($p = 0.015$), while the growth of *Lactobacillus acidophilus* strain LA-5 remained unaltered. Lutein has also shown comparatively strong iron chelation capacity of $78.9 \pm 2.14\%$ at 50 ppm concentration (standard EDTA showing $93 \pm 1.035\%$ at 10 ppm concentration). Also, the IC₅₀ value of Lutein (0.38 ± 0.167 ppm) obtained through the FRAP assay compared to that of ascorbic acid, indicates the iron-reducing capacity of solvent extracted lutein esters, used in this study. The iron chelation and reducing capacity of Lutein ester extract corroborates the differential growth regulation of microbes, as *E. coli* reported to depend upon the iron availability from the medium, while the growth of *L. acidophilus* remains indifferent to the ferric ion bioavailability from medium. These results indicate towards nutraceutical application of lutein esters for selective regulation of potential pathogens in human gut microflora.

Keywords: Marigold, Lutein, chelation, FRAP, Nutritional immunity, *L. acidophilus*, *E. coli*

HEALTHMEDICON/25/OP-012

EXPLORING THE SYNERGISTIC EFFECTS OF BIOACTIVE COMPOUNDS IN *Citrus maxima* MICROSFERES ON MODULATING INFLAMMATORY PATHWAYS USING *IN VITRO* AND *IN VIVO* MODELS

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Citrus maxima (Burm.) Merr. (Pomelo), a member of the Rutaceae family, is renowned for its ethnomedicinal, pharmacological, and phytochemical significance. Rich in bioactive compounds such as vitamins, amino acids, sterols, carotenoids, terpenoids, and polyphenols, it has been traditionally used in Ayurveda for managing conditions like cough, fever, asthma, diarrhoea, ulcers, and diabetes. Pomelo oil, extracted from its peels, is particularly valued for its stress-relieving, cardioprotective, hepatoprotective, anti-inflammatory, and antimicrobial properties. This study focuses on the formulation and evaluation of pomelo oil microspheres, along with the phytochemical profiling of pomelo oil using GC-MS. The oil was extracted using a Clevenger's apparatus and analyzed, revealing limonene and linalool as major constituents. Microspheres were formulated and characterized using SEM, FTIR, TGA, and XRD, among others. The formulations exhibited promising outcomes: particle sizes ranged between 888.045–1045.04 μm , with formulation F2 showing the smallest size. The swelling index was excellent, varying from 114.2 to 144.4, with F1 demonstrating the highest swelling property. Drug loading and encapsulation efficiency were highest in formulation F1, ranging from 88.98% to 98.23%. In vitro drug release studies showed maximum release for F1, while F3 exhibited the minimum. Both in vitro and in vivo evaluations confirmed the potential anti-inflammatory activity of the pomelo oil microspheres. These findings highlight the therapeutic potential of *Citrus maxima* as a natural source for anti-inflammatory applications, with pomelo oil microspheres serving as a promising alternative for managing internal and external inflammations.

Keywords: *Citrus maxima*, Microspheres, anti-inflammatory, phytochemical profiling

HEALTHMEDICON/25/OP-013

DEVELOPMENT OF CONSTITUTIVE GENE EXPRESSION SYSTEM FOR ADVANCING THE BIOENGINEERING OF THE FOOD GRADE LACTIC ACID BACTERIA

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Plasmids play a crucial role in the adaptability and functionality of bacteria, including lactic acid bacteria (LAB), which are extensively used in the food and healthcare industries. This study focuses on developing a food-grade constitutive gene expression system. A novel isolate, *Lactococcus lactis* CPE, was identified, harbouring three theta-type plasmids, pBCM1, pBCM2, and pBCM3. Additionally, a strong constitutive promoter from *Lactobacillus fermentum* M1 was characterized, driven by the lacL gene encoding β-galactosidase. The lacL promoter's constitutive activity was attributed to mutations in downstream *cre* sequences that regulate transcription. Two promoter fragments, lacL-M1_large and lacL-M1_small, were analysed, revealing that the *cre* sequence upstream of the -35 region in lacL-M1_large enhances transcription. Based on these findings, the plasmid pSK207 was constructed as a food-grade, broad-host-range constitutive gene expression vector for LAB using origin from pBCM1, lacL-M1_large promoter, in house Multiple cloning site. To extend its versatility, the pSK207 vector was fused with the pUC19 origin of replication, resulting in pVBL25, a Gram-negative: Gram-positive shuttle vector. The pSK207 and pVBL25 vectors exhibited high stability and carrying capacity in LAB and *E. coli*, respectively. The recombinant vector pVB-GFP, expressing GFP constitutively, demonstrated potential for labelling and tracking LAB and for promoter-probe studies. The developed vector series represents a significant advancement in LAB bioengineering, with applications in protein production, therapeutics, and translational research. These vectors pave the way for efficient and food-safe genetic manipulation of LAB for industrial and clinical applications.

Keywords: pBCM1, *Lactococcus lactis*, CPE, vector.

HEALTHMEDICON/25/OP-014

INNOVATIVE EDIBLE HYDROGELS: ENHANCING PHYTOCHEMICAL DELIVERY AND SUSTAINABLE FOOD PACKAGING

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Edible hydrogels represent a promising vehicle for the delivery of phytochemicals and have shown innovative potentials in food packaging and nutraceutical applications. It particularly addressed the polysaccharide-based systems that comprised edibles hydrogels and their preparation and potential applications. By using materials like sodium alginate, pectin, and turmeric, we show micro hydrogel beads and hydrogel-based bandages that entrap bioactive compounds inside. A simple preparation method of sodium alginate and pectin gel beads cross-linked by calcium chloride with turmeric powder loaded was carried out. The output is

essentially just retelling the process but stating Coatings for Photochemical separately which improves the stability and solubility of the phytochemicals and offers an environmentally friendly alternative to traditional packaging materials. Such edible hydrogels exhibit great versatility in nutraceutical delivery with respect to both health improvements and environmental concerns. As initial studies, we found these hydrogels powerful vehicles for diverse bioactive compounds and hope that this work opens opportunities for future investigations. These results highlight the significance of edible hydrogels in the evolution of foodtech and sustainable practices.

Keywords: Edible hydrogels, Phytochemical delivery, Sodium alginate, Pectin, Nutraceuticals.

HEALTHMEDICON/25/OP-015

ENDING ANIMAL CRUELTY: A CALL FOR COMPASSION AND CHANGE IN PRECLINICAL ANTIULCER EVALUATION

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Ulcers, a prevalent gastrointestinal disorder, impose significant health burdens worldwide. Though plenty antiulcer drugs are available, there is always a dearth of an economical, more effective drug. Traditional experimental in-vivo approaches involve animal-sacrifice, raising ethical concerns, while in-vitro models do not show the antiulcer effect directly on the tissue. In response, our study developed a non-invasive model, eliminating the need for animal-sacrifice and cruelty while ensuring reliable results. In this study the billy stomach was collected from butcher house and mounted on the test bed with Physiological salt solution (PSS) and oxygen competence. 0.1 N HCL used to induce ulcer. The antiulcer potential of the standard drug was evaluated by blue index and ulcer index. The recurrent data was subjected for statistical analysis and validated with the conventional antiulcer models. The tissues were treated with (PSS) (Gp-I), PSS + 0.1N HCL(Gp-II), PSS + 400 mg marketed antiulcer drug + 0.1N HCL (Gp-III), the blue index of were 52.95 ± 4.12 , 83.42 ± 2.34 and 64.48 ± 3.78 and the ulcer index were 1.68 ± 0.25 , 13.16 ± 1.28 , 3.94 ± 0.72 respectively. The utilisation of a non-invasive model underscores its applicability in ethical research practices, fostering, otherwise the abundant use of laboratory animal may make them extinct in near future. Science can also bring back the extinct species back to life methodically by De-extinction/ species revivalism but what we can do as mere responsible human citizen is to protect our flora and fauna. Preclinical research is indispensable, but discovery of parallel in-vitro model is substantial to minimise the sacrifice of the laboratory animals.

Keyword: Anti-ulcer activity, In vitro model development, *in-vitro* anti-ulcer model, De-extinction.

HEALTHMEDICON/25/OP-016

RECENT MODALITIES IN AMBLYOPIA MANAGEMENT

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Amblyopia is unilateral or less commonly, bilateral reduction of best corrected visual acuity that cannot be attributed directly to the effect of any structural abnormality of the eye or the posterior visual pathway. Since 1720 patching is coming like mainstay of amblyopic treatment, till 2014 full time Occlusion & cyclopaedic therapies are recommended though ATS-IIA & ATS-IIB has reduced the number of hours, but patching comes with drawbacks like appearance & eye deviation. The literature search was done targeting clinical trials, case reports, review articles and others to collect maximum information regarding patient history, symptoms, aetiology, path physiology, diagnosis, reviews, feedback and management of AMBLYOPIA. In view of this, data was systematically pulled together and synthesised provide a comprehensive overview of Newer Modalities in Amblyopia. PEDIG conducted a randomized control trial comparing 7 days/week and 1 h/day of falling blocks game versus 2 h patching and found them equivalent. Less than ¼ children in PEDIG study 75% of prescribe treatment time. Binocular treatment of amblyopic using video games Falling blocks game. Well-designed multi-centre randomized clinical trial, but authors found no difference home-based binocular falling-blocks videogame. The landscape of amblyopia therapy is evolving rapidly, with a focus on innovative treatments that leverage technology and a better understanding of visual development These advancements hold promise for improving outcomes for patients of all ages.

Keywords: Amblyopia, Visual acuity, PEDIG & BRAVO.

HEALTHMEDICON/25/EOP-001

SPECTRUM OF USE OF FERRIC CARBOXYMALTOSE IN HEART FAILURE PATIENTS WITH NYHA FUNCTIONAL CLASSES II AND III

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Heart failure is a prevalent condition affecting millions globally, often complicated by iron deficiency, which exacerbates symptoms and reduces quality of life. This study aimed to evaluate the efficacy and safety of intravenous ferric carboxymaltose (FCM) in heart failure patients classified as NYHA Functional Classes II and III. A prospective observational study was conducted over six months at the Krishna Institute of Medical Sciences and registered at CTRI (CTRI/2022/06/043343), involving 90 patients with iron deficiency. Key parameters assessed included haemoglobin levels, serum ferritin, transferrin saturation (TSAT), NYHA functional class, and six-minute walk test (6MWT), Borg's scale, and ejection fraction outcomes. The mean haemoglobin level improved significantly from 10.3 ± 1.5 g/dL at baseline to 13.4 ± 1.2 g/dL at three months ($p < 0.001$). Ferritin levels increased from a mean of 65 ± 20 μ g/L to 340 ± 50 μ g/L ($p < 0.001$), and 86.6% of patients transitioned to NYHA Functional Class I-II. Six-minute Walk test distances improved by an average of 80 meters ($p < 0.001$). Borg's scale scores decreased from 5.6 ± 1.2 to 3.2 ± 0.9 , indicating reduced dyspnoea ($p < 0.001$). Ejection fraction increased from $35 \pm 6\%$ to $40 \pm 5\%$ ($p < 0.001$). Few adverse effects, such as mild injection-site reactions, were reported. In conclusion, FCM demonstrated substantial improvements in iron parameters, clinical symptoms, and functional capacity, highlighting its potential as an effective treatment for heart failure patients with iron deficiency.

Keywords: Heart failure, Ferric Carboxymaltose, NYHA Functional Class, Iron deficiency, Six-minute Walk test.

HEALTHMEDICON/25/EOP-002

COMPARATIVE ASSESSMENT OF THE THERAPEUTIC EFFICACY OF ENCAPSULATED ANDROGRAPHIS PANICULATA EXTRACTS IN DIABETES-INDUCED LIVER AND KIDNEY DYSFUNCTION IN RATS

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This study investigates the antidiabetic, hepatoprotective, and Reno protective effects of *Andrographis paniculata* extracts, emphasizing the enhanced efficacy of encapsulated forms in diabetic rats with liver and kidney damage. Known as the "King of Bitters," *Andrographis paniculata* is a key herb in traditional Ayurvedic medicine. Diabetes mellitus, characterized by chronic hyperglycaemia, is a major contributor to liver and kidney dysfunction. Diabetes was induced in rats using nicotinamide (110 mg/kg) and streptozotocin (55 mg/kg). Encapsulated and non-encapsulated extracts of *A. paniculata* were administered. Biochemical assays, histopathological analysis, and oxidative stress marker evaluation were conducted. Encapsulated *A. paniculata* significantly reduced blood glucose, HbA1c, triglycerides, and serum creatinine while increasing HDL levels. Liver function tests showed decreased SGOT,

SGPT, and bilirubin levels, indicating improved hepatic function. Histopathological analysis revealed reduced steatosis, inflammation, fibrosis, and cellular damage in liver and kidney tissues. Oxidative stress markers like malondialdehyde decreased, while antioxidant enzymes, such as superoxide dismutase, increased. The encapsulated extract demonstrated superior therapeutic effects. Encapsulated *Andrographis paniculata* exhibits enhanced antidiabetic, hepatoprotective, and Reno protective properties, offering a promising treatment for diabetes-related liver and kidney dysfunction.

Keywords: *Andrographis paniculata*, Streptozotocin, Antioxidative Effects, Hepatoprotection, Renoprotection

HEALTHMEDICON/25/EOP-003

GLOBAL TELEMEDICINE ADOPTION: A NEW ERA OF HEALTHCARE DELIVERY

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The increasing recognition of telemedicine signifies a new age in global healthcare delivery, transcending geographical borders and revolutionising patient care. This study investigates the factors driving the global expansion of telemedicine, such as advances in digital technology, increased internet penetration, and rising demand for accessible and efficient healthcare services. Key benefits, such as increased patient engagement, lower healthcare costs, and better access to experts, are weighed against the obstacles of regulatory compliance, data security, and technology gaps in low-resource countries. Furthermore, the importance of telemedicine in global emergencies, like as the COVID-19 pandemic, demonstrates its ability to meet urgent healthcare requirements while reshaping established care models. This paper delves into considering future directions, such as advancements in AI-powered telehealth platforms, integration with wearable devices, and legislation to promote fair telemedicine usage worldwide. Telemedicine is emerging not only as a technology innovation, but as a catalyst for developing a more inclusive and efficient global healthcare environment.

Keywords: Telemedicine, Global Healthcare, Digital Technology, Internet penetration, AI-powered telehealth platforms, wearable devices.

HEALTHMEDICON/25/EOP-004

EFFICACY OF UMBELLIFERONE-LOADED NANOSTRUCTURED LIPID CARRIER IN THE MANAGEMENT OF BLEOMYCIN-INDUCED IDIOPATHIC PULMONARY FIBROSIS: EXPERIMENTAL AND NETWORK PHARMACOLOGY INSIGHT

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Idiopathic Pulmonary Fibrosis (IPF) is a severe progressive lung disease with a poor prognosis, emphasizing the need for innovative treatments. Nanostructured lipid carriers (NLCs) have emerged as effective drug delivery systems for targeting lung tissues. This study aimed to formulate and evaluate umbelliferone (UMB)-loaded NLCs for IPF treatment. UMB-NLC was prepared using the hot emulsion ultrasonication method and was characterized. The formulation was then tested for therapeutic application in a bleomycin-induced IPF mice model. Leukocyte infiltration and interleukin-6 (IL-6) were analyzed in bronchoalveolar lavage fluid (BALF), alongside antioxidant activities and histopathology. Particle size analysis showed a mean size of 174.9 ± 3.66 nm, suitable for lung targeting. A Zeta potential of -34.3 ± 1.35 mV indicated stability, while FTIR confirmed successful drug encapsulation. XRD and DSC analyses revealed UMB-NLC's amorphous nature, enhancing solubility and bioavailability. FESEM indicated uniform spherical nanoparticles, while entrapment efficiency ($85.03 \pm 2.36\%$) and drug loading ($17.01 \pm 0.48\%$) demonstrated effective drug incorporation. Sustained drug release over 48 hours suggested prolonged therapeutic efficacy. In vivo, UMB-NLC improved body weight and lung/body weight ratio and reduced BALF leukocyte infiltration and IL-6 levels ($**p < 0.01$). Biochemical assays showed reduced oxidative stress, with lower hydroxyproline ($**p < 0.01$), malondialdehyde ($***p < 0.001$), and total protein ($**p < 0.01$), and increased GSH ($***p < 0.001$), SOD ($**p < 0.01$), and CAT ($**p < 0.01$). Histopathology confirmed reduced fibrosis and restored lung structure. Network pharmacology identified UMB-IPF-related pathways and hub genes, with KEGG and GO enrichment highlighting UMB's therapeutic pathways. Therefore, UMB-NLC may exhibit therapeutic potential, offering targeted drug delivery, enhanced bioavailability, and improved efficacy in alleviating pulmonary inflammation and fibrosis.

Keywords: Gene Ontology, Idiopathic pulmonary fibrosis, KEGG, Network pharmacology, Umbelliferone-NLC.

EVALUATION OF NEUROPROTECTIVE EFFECT OF *CURCUMA CAESIA* (BLACK HALDI) AGAINST ICV-STZ INDUCED ALZHEIMER'S DISEASE IN RATS

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Memory loss, behavioral abnormalities, and cognitive decline are hallmarks of Alzheimer's disease (AD), a progressive neurological illness. The poor effectiveness of current pharmaceutical treatments has prompted research into alternative therapeutic agents. *Curcuma caesia* has shown promise as a neuroprotective agent due to the presence of antioxidant properties in it. In this work, the neuroprotective properties of *Curcuma caesia* are examined in a rat model of Alzheimer's disease caused by intracerebroventricular (ICV) administration of streptozotocin (STZ). Five groups of adult male Wistar rats were randomly assigned: (1) Sham control group, (2) Toxic group (stz-icv induced Alzheimer's) (3) dose 1 of *Curcuma caesia* 250 mg/kg+stz-icv (4) dose 2 of *Curcuma caesia* 500 mg/kg+stz-icv (5) standard donepezil-treated group. In addition to biochemical assays to measure oxidative stress indicators, acetylcholinesterase activity, and inflammatory cytokines in the brain, the rats were subjected to behavioral tests (passive avoidance test, Morris water maze) to assess cognitive performance. Brain tissue was examined histopathologically to look for plaque development and neuronal damage. In comparison to the STZ-induced AD group, the results demonstrated that *Curcuma caesia* treatment dramatically enhanced cognitive function, decreased oxidative stress, decreased acetylcholinesterase activity, and mitigated neuronal damage. High-dose *Curcuma caesia* revealed effects comparable to the conventional medicine, donepezil. These outcomes suggest that *Curcuma caesia* have a promising neuroprotective effect and could be a potential therapeutic option for managing Alzheimer's disease. Further studies are needed to evaluate its mechanisms of action and long-term efficacy.

Keywords: Alzheimer's disease, *Curcuma caesia*, streptozotocin, cognitive function, acetylcholinesterase, neurodegeneration.

HEALTHMEDICON/25/EOP-006

RESPECT AND PROFESSIONALISM-RELATED FACTORS CAUSING EMPLOYEE TURNOVER: AN EMPIRICAL-BASED COMPARATIVE STUDY IN PRIVATE HOSPITALS AT KOLKATA CITY

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This descriptive research aims at identifying the respect and professionalism-related factors causing employee turnover among para-medical managers working in private multi-speciality and private single-speciality hospitals in Kolkata city of India. The study sampled 120 respondents (60 from multi-speciality and 60 from single-speciality hospitals respectively) using both convenience and judgement sampling methods. Primary data were collected using a questionnaire and secondary data were collected from books, journals, and websites. The

percentage method was employed to analyze data. The result discovered that lack of respect, the dominance of the medical personnel (e.g., Doctors, surgeons), and the involvement of Directors (Chairman) or doctors' relatives in controlling managers are the foremost factors causing the turnover; and these factors have been equally perceived by managers working for both kinds of organizations. The next foremost factors are the involvement of non-medical professionals (e.g. Housekeeping, Medical Records, Insurance) to control paramedical managers, underemployment, performing non-managerial activities, and lack of professionalism. Besides, there is no difference in the perception of these factors among managers of both kinds of organizations. Politics among staff especially with senior staff, and underestimation and inferior opinions by other professionals are the least factors causing employee turnover; the perception of these factors among managers of both kinds of organizations is equal.

Keywords: manager, respect, professionalism, employee turnover, private multi-speciality hospital, private single-speciality hospital, Kolkata city.

HEALTHMEDICON/25/EOP-007

DECIPHERING THE ROLE OF EXTRACELLULAR MATRIX PROTEINS IN NON-SMALL CELL LUNG CANCER TUMORIGENESIS

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Lung cancer remains one of the most frequently diagnosed malignancies, with detection rates varying across heterogeneous patient cohorts. Non-small cell lung cancer (NSCLC), accounting for 80% of lung cancer cases, is highly invasive and associated with low survival rates despite extensive research. The extracellular matrix (ECM) serves as the structural backbone supporting cellular activities. Aberrant changes in ECM composition, known as ECM remodeling, are characteristic of many tumors, facilitating their proliferation and metastasis. This remodeling also confers drug resistance, leading to treatment failure and decreased patient survival. Investigating ECM remodeling in cancer tissues provides mechanobiological insights into tumor progression and metastasis. This study employs a computational approach to investigate differential expression of genes coding for ECM proteins in primary NSCLC tumors. We utilized RNA-sequencing data from lung adenocarcinoma (LUAD) and lung squamous cell carcinoma (LUSC) datasets of The Cancer Genome Atlas (TCGA) project to analyze gene expression using a bioinformatics pipeline. Downstream analysis integrated data analysis and network biology approaches using in-silico tools and databases. Our investigations reported a total of 7121 protein coding differentially expressed genes, among which 356 coded for ECM proteins. Our findings underscore the significance of ECM protein differential expression in tumorigenesis, affecting key pathways in NSCLC. Notably, we report an overexpressed protein fibronectin leucine-rich repeat transmembrane 1 (FLRT1) as a novel and promising molecular candidate for early-stage prognosis of NSCLC.

Keywords: lung cancer, non-small cell lung cancer, extracellular matrix, RNA-seq data, biomarker

HEALTHMEDICON/25/EOP-008

ROLE OF COMMUNITY-BASED REHABILITATION IN MODERATE AND SEVERE PHYSICAL TRAUMATIC INJURIES

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Traumatic injuries lead to long-term physical, psychological, and social challenges, highlighting the importance of comprehensive rehabilitation beyond hospital care. The study identifies key rehabilitation gaps in physical, mental, vocational, and social support systems. A narrative review of recent studies indicates that a significant number of trauma survivors face persistent physical limitations, mental health issues like depression and Post-Traumatic Stress Disorder (PTSD), and barriers to employment and social reintegration. Sociodemographic factors, lack of family support, and limited vocational opportunities exacerbate recovery challenges. The study emphasizes the need for multidisciplinary rehabilitation approaches, integrating physical therapy, psychological counselling, and vocational rehabilitation tailored to individual needs. Community-based interventions should also incorporate family education programs and policy-level changes to improve access to rehabilitation services. It is revealed that after discharge from trauma centers 46% of patients had unmet rehabilitation needs, particularly related to specialist follow-ups, rehabilitation services, and social support. These unmet needs were linked to factors such as age, preinjury comorbidities, and impaired functioning, highlighting the necessity for targeted interventions for specific patient groups. The study underscores the need for improved service provision, identifying gaps between rehabilitation needs and available services, assessing rehabilitation needs, outcomes, and associated costs, and providing valuable insights into service planning and resource allocation. The findings advocate for standardized rehabilitation guidelines and personalized care plans to address unmet needs and improve long-term recovery outcomes for trauma survivors.

Keywords: Community-based rehabilitation, Traumatic injuries, Quality of life, PTSD, Mental Health.

HEALTHMEDICON/25/EOP-009

INVESTIGATING NOVEL MYCOBACTIN MIMICKING ANALOGUES AS NON-NUCLEOSIDE MBTA-MBTB INHIBITORS TO ADDRESS ANTIMICROBIAL RESISTANCE IN TUBERCULOSIS

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Rising extensively drug-resistant tuberculosis (XDR-TB) strains demand novel therapies targeting unique pathways. Mycobactin metabolism in mycolate actinobacteria sustains mycobacteria by providing essential iron during scarcity in host macrophages by the production of "mycobactin," a salicyl-capped peptide. The mycobactin megasynthase cluster houses 14 genes (mbtA-mbtN). The MbtA-MbtB enzyme complex (catalyzing the first step of mycobactin biosynthesis), critical to mycobactin metabolism, is conditionally essential for mycobacterial survival in the iron-deficient host environment, presenting a potential target for

novel drug development (1). Our efforts have focused on identifying non-nucleoside MbtA inhibitors to disrupt this essential metabolic pathway, as the reported nucleoside MbtA inhibitors have poor pharmacokinetic profiles. Our recent studies by Shyam et al. have developed a proof-of-concept for the designed scaffolds to be potent against both *Mycobacterium tuberculosis* and non-tuberculous mycobacterial (NTM) complex. In line, we have designed novel thiazole- and pyrazoline-based analogues (bioisosteric replacements) inspired by two distinct structural scaffolds of mycobactin. Molecular docking, dynamic simulations, and pharmacophoric profiling confirm their drug-like properties, supported by whole-cell phenotypic evaluations. Based upon these outcomes, we have made a discussion and aim to present these unpublished findings of chemical synthesis, characterization, biological activities, and structures at the conference. This presentation will emphasize the rationale and importance of this timely strategy to address antimicrobial resistance (AMR) in tuberculosis (TB).

Keywords: MbtA-MbtB inhibitors, Tuberculosis, Siderophores, and Efflux pump

HEALTHMEDICON/25/EOP-010

INTEGRATING QbD FOR THE SOLUBILITY AMELIORATION OF IVACAFTOR LOADED SOLID LIPID NANOPARTICLES *IN VITRO* AND *IN VIVO*

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The present investigation is focused on the application of the Quality by Design (QbD) approach for the development and optimization of SLN formulation of Ivacaftor (IVF). IVF SLN was formulated with the help of homogenization and ultrasonication methods by incorporating Labrasol as liquid lipid, Cetyl palmitate as solid lipid and Polysorbate 20 as the surfactant. The independent variables such as the amount of Lipid (X1) and amount of surfactant (X2) were studied for their effect on dependent variables namely entrapment efficiency and particle size. The final formulation of IVF-SLN showed a narrow range in size distribution (PDI-0.276 ± 0.014) with a particle size of 102.3 ± 2.34 nm and entrapment efficiency of 78.32 ± 2.36. IVE incorporation into the imperfect crystal lattice was confirmed with the help of a DSC study. In-vitro and In-vivo diffusion showed enhanced profiles for the optimized formulation of IVF-SLN.

Keywords: CFTR modulator, Solid-lipid nanoparticles, Solubility enhancement, In-vitro diffusion, In-vivo diffusion, Bioavailability enhancement

HEALTHMEDICON/25/EOP-011

EFFECT OF CORE STRENGTHENING IN POSTPARTUM LOW BACK PAIN

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The significant impact of postpartum LBP and its associated conditions, DRA, on the health and quality of life of mothers is recognized. This review synthesizes existing research into exercise interventions aimed at managing these conditions, emphasizing the public health significance of this field. Major conclusions are that exercises for core stability, both in isometric and isotonic modality, narrow the width of the linea alba in females with DRA, improve lumbopelvic control, and reduce pain and disability. Stabilizing exercises, as a single entity or in conjunction with other forms of treatment, showed highly significant improvements for pain intensity, functional disability, and muscle strength. Adding PFM exercises to stabilization programs enhances lumbar ROM through synergistic activation of abdominal and pelvic floor muscles. Pilates therapy is more effective than conventional therapy, providing significant benefits in pain reduction, abdominal muscle strength, and quality of life by enhancing neuromuscular control, balance, and gait. Supervised exercise programs are always superior to unsupervised home-based programs in reducing pain and disability. Although exercise interventions are shown to be beneficial, it is not possible to make firm conclusions regarding exercise type, intensity, and duration because of heterogeneity in individual factors like pre-existing conditions and mode of delivery. This review highlights the importance of targeted exercise interventions in improving maternal health and reducing the public health burden of postpartum LBP.

Keywords: Post partum, Diastasis recti (DRA), low back pain (LBP), pelvic floor muscles (PFM), Core strengthening, Public Health

HEALTHMEDICON/25/EOP-012

ISOLATION, CHARACTERIZATION OF BETULINIC ACID FROM STEM BARK OF *PLANTANUS ORIENTALIS* AND ITS C-30 ANALOGUES AS POTENT CYTOTOXIC AGENTS

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Betulinic acid (BA) was isolated in bulk quantity from DCM- MeOH (1:1) extract of the stem bark of *Plantanus orientalis* and was further purified by crystallization and characterized using ¹H, ¹³C NMR, and HRESI-MS analysis. In the present study, the alkene functionality of the C-30 position of BA was targeted for carrying out synthetic modification. Using six distinct human cancer cell lines prostate (PC3), lung (A549), human hepatocellular carcinoma (HepG2), human leukemia (Molt-4), pancreatic (Panc-1), and breast (MCF-7), all of the

derivatives were assessed for cytotoxic activity using the MTT assay. Among all the synthesized analogous, 30-((4-cinnamylpiperazin-1-yl)methyl)betulinic acid was displayed as the most promising cytotoxic agent with IC₅₀ values of 7.43 µM, 9.1 µM, and 9.64 µM against A549, MCF-7, and PC3 cancer cell lines, respectively,. A subsequent mechanistic investigation verified that compound 16 caused substantial cell death by causing A549 cells to undergo apoptosis and stopping the cell cycle in the G1 phase. The findings suggest that more study has to be performed on these compounds, since they may develop into a promising lead. The findings suggest that more study be done on these compounds, since they may develop into a promising lead candidate in future research.

Keywords: Betulinic acid; *Plantanus orientalis*; Triterpenoid; Anticancer; A549 cell lines

HEALTHMEDICON/25/EOP-013

PREPARATION OF CHARACTERIZATION OF DRUG LOADED NLCs FOR TARGETING DRUG FOR EFFECTIVE MANAGEMENT OF RHEUMATOID ARTHRITIS

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Rheumatoid arthritis (RA) is a autoimmune persistent illness that causes inflammation and pain in the joints. Untreated, RA can make extreme harm the joints and their surrounding tissue. The risk factors incorporate age orientation, hereditary qualities, and natural openness (cigarette smoking, air contamination, and word related). Iguratimod (IGU) is a new disease-modifying anti-rheumatic drug have both immuno-suppression and anti-inflammatory effect and has demonstrated good efficacy and safety in clinical trials and was approved for active RA. IGU plays a significant immunomodulatory effect in the synovial tissue of rheumatoid joint by repressing the development of immunoglobulins and cytokines and controlling T lymphocyte subsets. The treatment and management of Arthritis remain challenging with current therapeutic system due to insufficient drug delivery to the joints, even with high doses. Therefor the development of innovative drug delivery system is crucial to enhance the concentration of drug reaching the inflammatory reason of joint. Nano lipid carrier (NLCs) are emerging as promising drug career due to their flexible surface functionality, Nanoscopic structures, monodispersity and high in encapsulation efficiency make NLCs a potential targeted drug delivery systems. Drug loaded NLCs were prepared by emulsification methods and characterized for size and size distribution, surface and shape morphology, and drug content. Targeting ligand I.e. chondroitin sulphate was conjugated on the surafce of NLCs. The average particle size was found 137.5±4.3 nm. Prepared formulation found in spherical in shape and smooth in surface. The drug content was found 67%. The prepared formulation were found stable at elevated temperature and shown 62% cumulative % drug release in phosphate buffer pH 7.4. It was concluded that prepared formulation found stable and use for further evaluation for in-vivo study.

Keywords: Drug Delivery, Targeting, Ligands, NLCs, Arthritis

HEALTHMEDICON/25/EOP-014

**DEVELOPMENT OF ECO-FRIENDLY NANOCOMPOSITE COATINGS FOR
ENHANCING BIOCOMPATIBILITY AND DURABILITY OF ORTHOPAEDIC
IMPLANTS**

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Orthopaedic implants face various challenges, including infections, complications such as amenorrhea in women, and the risk of tumour formation at implant sites. To address these issues, a surface coating using polymer-based herbal nanoparticles offers an effective solution. This approach enhances the implant's biocompatibility, prevents bacterial adhesion, and promotes better integration with bone tissue. In this study, zinc oxide nanoparticles were synthesized through an environmentally friendly process using *Saraca asoca* leaf extract. The nanoparticles were blended with a polymer to create a hybrid material, which was applied to titanium implants. Comprehensive testing was conducted to evaluate the antimicrobial properties, resistance to corrosion, and compatibility with biological systems. The results showed that the coated implants demonstrated superior performance compared to untreated titanium. This eco-friendly and cost-efficient method paves the way for advanced surface treatments, addressing critical challenges in orthopaedic implant technology.

Keywords: Orthopaedic implants, Surface coating, Nanoparticles, Green synthesis, *Saraca asoca*

HEALTHMEDICON/25/EOP-015

**ENVIRONMENTALLY SUSTAINABLE PLANT FIBERS USED IN HERBAL
SANITARY NAPKINS**

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The present research focuses on developing a biodegradable sanitary napkin utilizing a combination of cotton and banana fiber, offering a sustainable alternative to traditional products. This not only addresses environmental concerns but also meets women's health needs. The incorporation of herbal elements like *Aloe vera*, *Mentha*, and *Melia Dubia* provides additional benefits such as soothing properties, odor control, and added antimicrobial protection to the user. To evaluate the prepared herbal sanitary napkins, several tests were conducted like PH, Absorption test, and Leakage test. The inclusion of natural fibers like cotton and banana not only reduces environmental impact but also offers a healthier option for women. Moreover, it aligns with the increasing demand for sustainable and eco-friendly products in the market.

Keywords: Plant fibers, Herbal sanitary napkins, Natural Absorbency, Ecofriendly and
Biodegradable

HEALTHMEDICON/25/EOP-016

FORMULATION AND EVALUATION OF DOLUTEGRAVIR SODIUM INCLUSION COMPLEX LOADED ORAL FILM

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Dolutegravir sodium is potent antiretroviral drug which has a very low solubility in Gastrointestinal (GI) fluids, which results in poor bioavailability after oral administration. The present investigation aimed to formulate and evaluate fast dissolving oral films containing dolutegravir sodium to overcome solubility and bioavailability problems thereby facilitating the convenience of pediatric and geriatric patients. The inclusion complexes of Dolutegravir sodium with β -cyclodextrin were prepared. A solution study was performed to fix the ratio with better dissolution rate. The selected inclusion complex was then utilized for the preparation of fast dissolving oral films by solvent casting method using HPMC E15 as film-forming agents, sodium starch glycolate as super disintegrating agents. Glycerol was used as a plasticizer. Nine formulations were prepared and evaluated for their physicochemical properties. *In vitro* disintegration, dissolution studies were carried out. Formulation F2 showed the minimum *in vitro* disintegration time (14.94 ± 3.06 s), formulation F9 showed the maximum *in vitro* disintegration time (36.66 ± 1.05 s). The formulations F6 and F4 showed better drug release of 94.4% and 92.9%, respectively. Better drug permeation of 96.65% was obtained from the formulation F6 in 40 s. The study concluded that the fast-dissolving films achieved quicker onset of action compared to the conventional preparations. The formulation was found promising to obtain better therapeutic efficiency.

Keywords: β -Cyclodextrin, Dolutegravir sodium, Oral Film, Inclusion complex

HEALTHMEDICON/25/EOP-017

ABUSE DETERRENT DOSAGE FORM TECHNOLOGY BASED ON AN INTEGRATION OF NOVEL DRUG AND ION EXCHANGE RESIN

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Prescribed medication abuse refers to the possible improper use of pharmaceutical formulations. Several regulatory agencies are now working to strengthen the regulatory standards for both existing and upcoming formulations by implementing either partial or full abuse deterrent technology. Opioids are often and extensively abused drugs because of their widespread availability on the market. The common methods of abuse include using numerous tablets or altering the dosage forms. Regulatory agencies require dosage forms to include the ability to prevent these strategies. The physical and chemical modifications encompass several approaches, such as crushing, sniffing, chemical extraction, and syringe administration. A self-

regulating pharmaceutical dosage form was created employing an ion exchange resin and Tapentadol HCl as a representative medication. The formulation was created by combining a drug with an ion exchange resin complex and other excipient. This results in a strong dosage form that is resistant to a wide range of physical and chemical procedures used for drug abuse. The ultimate formulation was subjected to water extraction at both normal and high temperatures (over 90°C) to assess its extraction efficiency. The crushing strength of the mixture was verified using both a household coffee grinding machine and a laboratory mortar and pestle. The gelation property of Polyox prevented the solution from being used for intravenous misuse. The formulation was assessed using an *in vitro* dissolution study, as outlined in the guidance for industry provided by the US Food and Drug Administration (FDA). The dissolution of a solitary capsule versus several capsules (more than four) was conducted and verified the drug-ion exchange resin-based formulation's abuse-resistant characteristic.

Keywords: Abuse-Deterrent, Drug-Ion exchange resin complex, Overdose

HEALTHMEDICON/25/EOP-018

THE EFFECT OF THORACIC MOBILIZATION AND BREATHING EXERCISES ON RESPIRATORY FUNCTION AND MOBILITY IN PULMONARY CONDITIONS

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Restrictive or obstructive lung disorders have a significant impact on a person's ability to breathe effectively, leading to reduced oxygen intake and increased fatigue. These conditions can greatly diminish quality of life and may require ongoing medical management and lifestyle adjustments to help individuals cope with daily activities. Patients often experience chronic cough, exertion, and dyspnoea, which can result in a deep state of weakness. This study explores the effectiveness of non-invasive interventions such as thoracic and chest wall mobilization, along with breathing exercises, in improving respiratory function, reducing dyspnoea, enhancing mobility, and increasing overall quality of life in various populations. A total of 11 articles were included in this study, comprising systematic reviews, randomized controlled trials (RCTs), and case studies. Clinical trials were assessed using the PEDro score. The studies focus on thoracic mobilization and breathing exercises, with intervention durations ranging from 4 days to 8 weeks, aiming to alleviate symptoms and improve quality of life. Although there is promising evidence supporting these interventions, it is important to note that their effectiveness can vary based on individual patient characteristics and the specific respiratory conditions being treated. Therefore, personalized approaches that take these variables into account are essential for maximizing the benefits of thoracic mobilization and breathing exercises in clinical practice. Implementing such tailored strategies has the potential to improve the quality of life for individuals suffering from respiratory conditions, thereby facilitating better management and recovery.

Keywords: Chest wall mobilization (CWM), Breathing Exercises, Modified Medical Research Council (mMRC), Dyspnoea

HEALTHMEDICON/25/EOP-019

**RESPECT AND PROFESSIONALISM-RELATED FACTORS CAUSING
EMPLOYEE TURNOVER: AN EMPIRICAL-BASED COMPARATIVE STUDY IN
PRIVATE HOSPITALS AT KOLKATA CITY**

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This descriptive research aims at identifying the respect and professionalism-related factors causing employee turnover among para-medical managers working in private multi-speciality and private single-speciality hospitals in Kolkata city of India. The study sampled 120 respondents (60 from multi-speciality and 60 from single-speciality hospitals respectively) using both convenience and judgement sampling methods. Primary data were collected using a questionnaire and secondary data were collected from books, journals, and websites. The percentage method was employed to analyze data. The result discovered that lack of respect, the dominance of the medical personnel (e.g., Doctors, surgeons), and the involvement of Directors (Chairman) or doctors' relatives in controlling managers are the foremost factors causing the turnover; and these factors have been equally perceived by managers working for both kinds of organizations. The next foremost factors are the involvement of non-medical professionals (e.g. Housekeeping, Medical Records, Insurance) to control paramedical managers, underemployment, performing non-managerial activities, and lack of professionalism. Besides, there is no difference in the perception of these factors among managers of both kinds of organizations. Politics among staff especially with senior staff, and underestimation and inferior opinions by other professionals are the least factors causing employee turnover; the perception of these factors among managers of both kinds of organizations is equal.

Keywords: manager, respect, professionalism, employee turnover, private multi-speciality hospital, private single-speciality hospital, Kolkata city.

POSTER ABSTRACT

HEALTHMEDICON/25/PP-001

A COMPREHENSIVE REVIEW OF PRECISION NANOMEDICINE TO CURE LUNG CANCER [THE FUTURE OF MEDICINE]

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Lung cancer is a major cause of death worldwide, being often detected at a later stage due to the non-appearance of early symptoms. Therefore, specificity of the treatment is of utmost importance for its effective treatment. Precision medicine is a personalized therapy based on the genomics of the patient to design a suitable drug approach. Genetic mutations render the tumour resistant to specific mutations and the therapy is in vain even though correct medications are prescribed. Therefore, Precision medicine needs to be explored for the treatment of Non-small cell lung cancer (NSCLC). Nanoparticles are widely explored to give personalized interventions to treat lung cancer due to their various advantages like the ability to reach cancer cells, enhanced permeation through tissues, specificity, increased bioavailability, etc. Various biomarker genes have been identified through precision techniques for the diagnosis and treatment of NSCLC like EGFR, RET, KRAS, ALK, etc. Therefore, to target NSCLC effectively precision Nano medicine has been adopted in recent times. Here, we present different nanoparticles that are used as precision Nano medicine and their effectiveness against NSCLC disease.

Keywords: Precision Nano medicine, Lung cancer, genomics, Genetic mutations, NSCLC.

HEALTHMEDICON/25/PP-002

OPTIMIZATION AND DEVELOPMENT OF NARINGENIN-BASED TRANSFERSOMAL GEL: AN INNOVATION IN DIABETIC WOUND HEALING

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Flavonoids are widely used natural phenolic compounds, which have shown potential role in wound healing. Many pre-clinical studies have indicated that flavonoids are one of the most promising and important groups of natural compounds which can be used to treat acute as well as chronic wounds. Flavonoids can be classified as flavones, isoflavones, flavonols, flavanols, flavanones and anthocyanins, respectively. Naringin, the glycone part and naringenin the aglycone part falls under the broad umbrella of flavonoid class (flavanones) which are majorly obtained from various citrus fruits like lemon, orange, grapefruit. Several therapeutic roles have been documented for naringenin, such as anti-inflammatory, antioxidant, antiulcer, anticancer, wound healing activities. Due to challenges in solubility, it is crucial to encapsulate these compounds using nanotechnological platform to deliver and make them bioavailable for the treatment of several diseases. Nanocarriers like transfersomes act as self-adaptable ultra-deformable flexible bilayer vesicles composed of phospholipid and edge activators along with hydration media. The present study has focused on the beneficial role of the flavonoid naringenin with a special emphasis on naringenin encapsulated transfersomal gel towards healing of different diabetic wound conditions and exploring their underlying mechanisms. Quality by design (QbD) employing design expert software to optimize transfersomes and

further dynamic light scattering (DLS) studies, Fourier-transformed infrared spectroscopy (FT-IR) analysis, rheology studies, percentage entrapment efficiency followed by in-vitro drug release studies for naringenin encapsulated transfersomal gel has been evaluated. Development of naringenin embedded transfersomal gel has been carried out along with its in-vivo wound healing studies and percentage wound contraction has been assessed with an effective wound healing potential of the designed formulation.

Keywords: Flavonoids; nanotechnology; nanocarriers; drug delivery systems; diabetic wound healing.

HEALTHMEDICON/25/PP-003

EVALUATION OF ANTIOXIDANT AND ANTI-INFLAMMATORY POTENTIAL OF BIOACTIVE FRACTIONS FROM *FICUS GENICULATA KURZ* LEAVES

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Evaluation of the *in vitro* antioxidant and anti-inflammatory activity of bioactive fraction of the leaves of *Ficus geniculata* Kurz (Putkal). The leaves were extracted by Ultrasonic extraction method. Different fractions of leaves of *Ficus geniculata*, followed by *in-vitro* anti-oxidant and anti-inflammatory activities, to choose the bioactive fraction. The antioxidant properties were measured by using DPPH and ABTS radical scavenging activity and *in vitro* anti-inflammatory activity using albumin denaturation and heat-induced hemolysis methods. A dose-response curve was plotted to determine IC₅₀ values. Preliminary phytochemical analysis of all extracts revealed the presence of major classes of phytochemicals such as tannins, alkaloids, flavonoids, glycosides Ethyl acetate fraction of *Ficus geniculata* leaves were found to possess significant antioxidant properties as compared with the standard antioxidant ascorbic acid and also found significant *in vitro* anti-inflammatory activity compared with the standard drug diclofenac sodium.

The study indicates that the ethyl acetate fraction of *Ficus geniculata* leaves exhibits significant anti-inflammatory properties and can also be considered a good source of natural antioxidants. However, further *in vivo* studies are needed to confirm the efficacy of this leaves fraction in response to its anti-inflammatory action in rodent model.

Keywords: - *Ficus geniculata*, anti-oxidant, anti-inflammatory, ultrasonic extraction method, preliminary phytochemical analysis,

HEALTHMEDICON/25/PP-004

REVOLUTIONIZING RNA THERAPIES: THE ROLE OF LIPID NANOPARTICLES (LNPs)

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The therapeutic approach to genetic and viral disorders has been revolutionized by RNA-based therapies, yet challenges like poor cellular uptake and degradation persist. Lipid nanoparticles (LNPs) have emerged as a transformative delivery platform, addressing these limitations by

providing efficient transport, controlled release, and protection of RNA molecules like siRNA and mRNA. This study reviews the synthesis, structural composition, and application of LNPs in RNA drug delivery. Key components such as ionizable lipids, cholesterol, and PEG-lipids, which are essential for stability, encapsulation efficiency, and targeted delivery, are discussed. Recent advancements in LNP technology have significantly improved the pharmacokinetics, biodistribution, and therapeutic efficacy of RNA-based treatments. The clinical success of LNPs in mRNA vaccines, such as those developed by Moderna and Pfizer-BioNTech for SARS-CoV-2, as well as their potential applications in vaccines for other viral diseases like influenza and Zika, highlights their versatility and promise. Challenges such as immunogenicity and off-target effects are addressed, alongside future strategies for optimizing LNP systems. This work underlines the pivotal role of LNPs in advancing RNA therapies and their promising future in gene therapy and nanotechnology.

Keywords: RNA therapy, lipid nanoparticles, mRNA, siRNA, drug delivery

HEALTHMEDICON/25/PP-005

INNOVATIVE BIOPOLYMER-BASED DRUG DELIVERY SYSTEMS: A STEP TOWARDS SUSTAINABLE AND TARGETED THERAPEUTICS

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Biopolymers, derived from renewable resources, are revolutionizing drug delivery systems due to their biocompatibility, biodegradability, and ability to be engineered for targeted and controlled release. Recent innovations, such as nanotechnology-enhanced designs and stimuli-responsive systems, have unlocked the potential of biopolymers like chitosan, alginate, and polylactic acid (PLA) in creating advanced drug carriers. These systems have shown remarkable effectiveness in precise targeting of diseases, including cancer and diabetes, while minimizing side effects and enhancing therapeutic efficacy. The use of green synthesis methods and hybrid materials has further addressed scalability and environmental challenges, positioning biopolymers as sustainable and innovative solutions for modern therapeutics. Emerging technologies such as artificial intelligence and 3D bioprinting offer exciting opportunities for developing patient-specific drug delivery platforms, making biopolymers pivotal in the future of medicine. This work emphasizes the transformative role of biopolymers in advancing healthcare while addressing global health and environmental challenges, highlighting their potential to bridge the gap between material science and medical innovation.

Keywords: Biopolymers, Drug Delivery, Nanotechnology, Targeted Therapy, Sustainable Materials

HEALTHMEDICON/25/PP-006

CLICK CHEMISTRY: A NEW ERA OF REVOLUTION FOR DRUG DISCOVERY

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Click chemistry has revolutionised the field of drug discovery by offering a versatile and reliable synthetic approach that employs highly efficient reactions for lead identification, optimisation, and library generation. Central to this methodology is the copper(I)-catalysed azide-alkyne cycloaddition, a reaction notable for its simplicity, specificity, and compatibility with aqueous and biological systems. This review highlights the application of click chemistry in designing diverse and robust compound libraries, facilitating rapid structure-activity relationship profiling, and enabling bioconjugation for proteomics and DNA research. The near-perfect nature of click reactions ensures high yields, minimal purification, and extensive structural diversity. By embracing modularity and kinetically controlled reactions, click chemistry bridges the gap between traditional drug discovery methods and novel, unexplored chemical spaces. Its integration into biomedical research underscores its potential to accelerate drug development processes, from target identification to therapeutic innovation.

Keywords: Click Chemistry, Copper(I)-Catalysed Azide-Alkyne Cycloaddition (CuAAC), Drug Discovery, Combinatorial Chemistry, High-Yield Synthesis

HEALTHMEDICON/25/PP-007

REVOLUTIONIZING WOUND HEALING: NANOSPONGES EMBEDDED IN BIGEL SYSTEMS FOR ADVANCED TOPICAL THERAPY

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Wound healing remains a challenge for health care professionals, and novel modalities are urgently needed to improve the outcome of therapies delivered. This review describes another topical treatment, based on a nanosponges encapsulated in bigel systems. Bigels are hybrid gel systems composed of hydrogels and organogels. Their unique dual-phase structure provides a flexible platform for drug delivery. Because nanosponges are based on nanotechnology, they represent a drug delivery system and can provide synergistic options to overcome normal limits in wound care systems. Nanosponges are porous and show a wide loading capacity for drug delivery in a controlled way. Besides, bigel matrices give higher stability and bioavailability, and targeted delivery towards viable tissue at the wound site provides less systemic exposure and side effects. The bigel system also provides a perfect wound care environment by providing hydration, cell proliferation induction, and serving as a barrier against external contamination. This next-generation formulation combines the structural benefits of bigels with the therapeutic benefit of nanosponges to provide advanced topical treatment in the advancement of wound healing. *In-vitro* and *in-vivo* studies showed more drug loadings and longer duration of release with more rapid rates of wound closure when compared to their conventional counterparts.

Moreover, the system was also biocompatible and could be applied to almost all types of wounds, from chronic to complex. The present work focuses on the paradigm shift in topical treatments arising through the use of nanotechnology and opens new horizons to developing better and affordable solutions in wound care.

Keywords- Nanospunge, Hydrogels, Bigel, Wound Healing, Bioavailability

HEALTHMEDICON/25/PP-008

USE OF HERBAL DRUGS IN CARDIOVASCULAR DISEASE - A REVIEW

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Cardiovascular diseases (CVDs) rank among the foremost contributors to morbidity and mortality globally, necessitating the implementation of effective prevention and treatment modalities. Recently, herbal plants have garnered significant interest for their potential therapeutic effects on CVDs, attributed to their bioactive compounds, minimal adverse effects, and economic viability. This investigation delves into the therapeutic efficacy of herbal plants in the management and amelioration of CVDs, with particular emphasis on species such as *Crataegus* (Hawthorn), *Terminalia arjuna*, *Ginkgo biloba*, *Salvia miltiorrhiza* (Dan-shen), *Curcuma longa* (turmeric), and *Allium sativum* (garlic). These botanicals demonstrate cardioprotective attributes via mechanisms including antioxidant action, anti-inflammatory responses, enhancement of lipid profiles, and regulation of blood pressure. Phytochemicals such as flavonoids, saponins, alkaloids, terpenoids, polyphenols, and notable compounds like oligomeric procyandins are instrumental in mitigating oxidative stress, curbing platelet aggregation, and improving myocardial function. The review accentuates the necessity of incorporating herbal therapies into contemporary medical practices, underpinned by rigorous clinical trials to ascertain safety, efficacy, and standardized application. It may be concluded that herbal plants possess considerable potential as adjunctive or alternative therapies for CVDs, thus facilitating comprehensive strategies for managing cardiovascular health.

Keyword: Cardiovascular disease (CVDs), Herbal Plants, Therapeutic efficacy, Cardioprotective attributes, Phytochemicals, Alternative therapies.

HEALTHMEDICON/25/PP-009

UNLOCKING THE POTENTIAL BENEFITS OF *BACOPA MONNIERI*

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Indian Traditional medicine is one of the oldest medical sciences in the world. Ayurveda is the most widely used system in traditional Indian medicine, it emphasizes holistic healing and Brahmi is a reputed medicinal plant of Ayurveda. Brahmi is botanically *Bacopa monnieri* identified as *Bacopa monnieri* L. Pennell, it belongs to the family Scrophulariaceae. It is an annual creeping plant found in wet, damp, and marshy areas. In a study of the Export–Import Bank of India, was placed on the second position in a priority list of the most Important

medicinal plants, evaluated based on their and medicinal and commercial importance and potential for further research development. Phytochemical analysis of *Bacopa monnieri* extracts revealed the presence of various biochemical compounds such as alkaloids, bacosides, flavonoids, glycosides, triterpenoids and saponins etc. Bacosides are identified as the primary component responsible for therapeutic effects. *Bacopa monnieri* is used as memory enhancer; even many classical and proprietary preparations are now available on the market, but a vast range of studies have shown its potential therapeutic effects as neuroprotective agent, anti-depressant, anti-convulsant, anti-parkinsonian, antioxidant, anti-inflammatory, anti-cancer and anti-nociceptive etc. Currently there are only limited clinical trial studies on the effects of *Bacopa monnieri*. More studies must be done in the future to establish these effects clinically in the plant and corroborate the preclinical data. This poster highlights the potential of the plant and sheds light on research that has been done and what has not been done but may prove useful if done in the future.

Keywords: *Bacopa monnieri*, Chemical constituents, Bacosides, Memory enhancer, Anti-convulsant

HEALTHMEDICON/25/PP-010

ANTI-INFLAMMATORY & ANTI-ASTHMATIC PROPERTIES OF *FERULA ASAFOETIDA* AND *COLOCASIA ESCULENTA* POLYHERBAL FORMULATIONS: IN-VITRO & IN-VIVO ASSESSMENT

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In traditional medicine, especially in tropical and subtropical regions, *Colocasia Esculenta Linn.* (Family: Araceae) & *Ferula Asafoetida Linn.* (Family: Umbelliferae) are widely used throughout the world. Because these herbaceous plants have played an important role in relieving asthma, common cold, chronic cough, allergy, skin disorders since ancient time. The extracts of CE & FA have been widely used in the treatment of asthma. A wide range of chemical compounds including flavonoids, β -sitosterol, steroids, Asafoetidin, ferulic acids have been isolated from the species. From published articles in scientific databases, including PubMed, Google Scholar, and Scopus, until December 2019, it has been proven that extracts from these plants possess various pharmacological activities. This review specifically focuses on the phytochemical, anti-oxidant and anti-inflammatory activities of two medicinal plants. And a comparative study of the polyherbal formulation in different concentration to evaluate the anti-asthmatic activity in mice model induced with Ovalbumin (OVA).

Keywords: *Colocasia Esculenta*, *Ferula Asafoetida Linn.*, asthma, anti-inflammatory activity, Ovalbumin.

HEALTHMEDICON/25/PP-011

ELECTROSPUN NANOFIBERS: ADVANCED APPLICATION IN DRUG DELIVERY SYSTEMS & FABRICATION TECHNIQUES

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Electrospinning uses an electrostatic potential characterization by high voltage and very low current for creating ultrafine fibers. The popularity of electrospinning raised during the end of the 20th century when many publications started to appear and continue today, where many applications for electrospun fibres. Electrospun nanofibers for drug delivery systems introduce revolutionary means of administering pharmaceuticals by oral, sublingual, transdermal etc. holding promise for both improved drug efficacy and reduced side effects. While developing drug delivery systems, nanofiber technology has gained importance due to its high surface area to volume ratio and porosity. The mechanical properties and degradability of electrospun nanofibers allow them to be turned for specific uses, for instance, the electrospun nanofiber-assembled aerogels have extraordinary flexibility and elasticity. This porous nano-aerogel promotes wound hemolysis by reducing clotting time during contact with blood and electrospun nanofiber drug development of localized delivery of chemotherapeutic drugs could maintain the cytotoxic action of the drug, reducing the systemic toxicity in the patient. Using fluorescein sodium in pullulan- gellan gum nanofiber treated eye indicates a slightly higher permanence of the drug with respect to the normal eye drops. So, a multidisciplinary approach could help to address the main issues related to electrospun nanofibers. In the future, optimized scaffolds could represent a powerful tool to both clinics and patients, capable of combining non-invasive tissue engineering with a precise release of a drug. The unique features and the simplicity of customized nanofibers could represent an important step towards personalized medicine.

Keywords: Electrospinning, Nanofiber technology, Drug delivery system, Wound hemolysis, Cytotoxic action

HEALTHMEDICON/25/PP-012

PATHOPHYSIOLOGY OF HUMAN METAPNEUMOVIRUS (HMPV) AND ITS EVOLUTION THROUGHOUT THE COURSE OF TIME

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Respiratory viruses evolve constantly, primarily due to mutations in their genetic material as they replicate, leading to changes in its properties, including spreadability, severity, and its innate immunity to vaccine. This cycle of evolution enables these viruses to emerge throughout the course of time by adapting and changing with the conditions they have been put through. Human metapneumovirus (HMPV) was initially brought into light in 2001 as a respiratory bacteria causing flu-like symptoms in immunocompromised population. HMPV causes inflammation in the respiratory tract. The virus infects cells in the airways, triggering the body's immune response leading to the body releasing immune cells and chemicals to fight the virus, causing swelling and irritation in the airways, increased mucus to trap the virus causing congestion and coughing and rarely, even inflammation and mucus can narrow the airways, making it difficult to breathe. The year 2001 marked the discovery of this ominous virus with 2 major genotypes A and B with sub lineages A1, A2, B1, B2. Throughout the first quarter of this century, it has significantly evolved showing point mutations, recombination's, and

potential immune escape capabilities depicting that genotype varies regionally and temporally highlighting the spontaneous evolution of this biohazard. This inflammation can cause symptoms like cough, fever, runny nose, and difficulty breathing. In severe cases, it can lead to pneumonia or bronchiolitis. Respiratory viruses, including HMPV, exhibit continuous evolution, posing ongoing challenges for public health. Understanding their pathophysiology is crucial for effective prevention, diagnosis, and treatment.

Keywords: Human metapneumovirus, Evolution, Genetic, Pathophysiology, Complications

HEALTHMEDICON/25/PP-013

PHYTOCHEMICAL PROFILING AND BIOLOGICAL ACTIVITIES FROM THE FRUIT AND BARK OF *CYDONIA OBLONGA MILLER*

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Cydonia oblonga Miller, commonly known as quince, is a nutritionally rich fruit traditionally valued for its medicinal properties. This study focuses on the phytochemical profiling and biological activities of the fruit and bark of quince to explore its potential applications in nutraceuticals and pharmaceuticals. The fruit's pulp, peel, and seeds were analyzed, revealing a high concentration of phenolic compounds, particularly in the peel, including chlorogenic acid, catechins, and quercetin derivatives. These compounds exhibit potent antioxidant and antimicrobial activities. The peel demonstrated the strongest antioxidant activity, followed by the pulp and seeds, while processing into jam slightly reduced bioactivity. The bark, often overlooked, is suggested to contain bioactive compounds requiring further investigation. The findings highlight *Cydonia oblonga* as a promising source of bioactive molecules with significant therapeutic potential, including antioxidant, antimicrobial, and functional food applications. Future studies on the synergistic effects of fruit and bark extracts may provide deeper insights into their biological activities. This work emphasizes the role of *Cydonia oblonga* in promoting health and unveils its scope as a natural source of bioactive compounds for global healthcare applications.

Keywords: *Cydonia oblonga* Miller, phytochemical profiling, antioxidant activity, antimicrobial properties, functional food, nutraceuticals, bioactive compounds.

HEALTHMEDICON/25/PP-014

THE SYNERGISTIC EFFECTS OF PHLORETIN WITH OTHER BIOACTIVE COMPOUNDS IN DIABETES MANAGEMENT

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The synergistic effects between phloretin and other bioactive compounds in managing diabetes indicate much promise. Phloretin, a natural polyphenolic compound from apples, has been

found as an inhibitor of glucose transporters like Glucose Transporter 2 (GLUT2) and Sodium Glucose Cotransporter (SGLT1), which can be expected to ameliorate postprandial glycemia and levels of insulin. Lately, studies have tested various combinations of phloretin with other bioactive phytochemicals like Quercetin, a flavonoid commonly seen in fruits and vegetables. Such combinations have exhibited inhibition in glucose transporters, hence helping in diabetes control. Mechanisms through which phloretin and various bioactive compounds act include Inhibition of Glucose Transporter: Research has shown that phloretin and other bioactive compounds inhibit glucose transporters, which may lower glucose absorption and potentiate insulin sensitivity and Antioxidant and Anti-Inflammatory Effects. Such compounds have been shown to exhibit as antioxidant and anti-inflammatory agents helping to alleviate oxidative stress and inflammation, associatively linked to diabetes.

Keywords: Synergistic, Polyphenolic, Postprandial, Flavonoid, Insulin Sensitivity.

HEALTHMEDICON/25/PP-015

STANDARDIZATION OF HERBAL MEDICINES: CHALLENGES AND FUTURE DIRECTIONS

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Pharmacognosy and Phytochemistry is a branch of science which deals with acquiring knowledge (Gignosco) of crude drugs(Pharmacon).It also deals with the study of chemical composition of plants and their bioactive compounds.The use of herbal or phyto medicines dates back to 3000 BC as a form of traditional medicine systems and practices such as Ayurveda,Siddha,Unani,Homeopathy and others.Various chromatographic techniques such as TLC,HPLC,Flash chromatography are used for the isolation and purification of bioactive compounds from plant extracts.The history of herbal medicines is as old as human civilization.Pharmacognosy is an important link between Pharmacology and Medicinal Chemistry.As a result of rapid development of phytochemistry and pharmacological testing methods in recent years,new plant drugs are finding their way into medicine as purified phytochemicals,rather than in the form of traditional galenical preparations.Following the recent COVID-19 pandemic the demand for herbal medicines has grown due to it's efficacy,minimal side effects and cost friendly nature and commercialization sectors are unable to cope up with the growing challenges.Natural product medication development has significant technical and monetary hurdles, including a time-consuming formulation process, quality assurance, safety, promotion, and administrative issues.The quality control of phytopharmaceuticals may be defined as the status of a drug, which is determined either by identity, purity, content, and other chemical, physical or biological properties, or by the manufacturing process.Emerging technologies such as DNA barcoding and fingerprinting techniques are the antidote for facing these problems.Future directions in the standardization of herbal medicines require a multidisciplinary approach and collaboration among scientists, traditional medicine practitioners, regulatory authorities etc.

Keywords: Herbal Medicines, Pharmacognosy, Phytochemistry, Ayurveda, Standardization

HEALTHMEDICON/25/PP-016

**DESIGN OF UNIVERSAL CANCER VACCINES USING NATURAL TUMOR
VESSEL SPECIFIC ANTIGENS (SANTAVAC)**

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This review explores the potential of targeting tumor blood vessels (endothelial cells) as a novel cancer immunotherapy strategy. While targeting endothelial cells offers promise for inhibiting tumor growth, direct immunization with endothelial cell preparations carries the risk of autoimmune reactions. Recent research has identified unique alterations on the surface of tumor endothelial cells, providing a foundation for developing specific cancer vaccines. This approach aims to elicit immune responses that selectively target tumor blood vessels while sparing healthy ones. Identifying and isolating the specific molecules (antigens) present on tumor endothelial cells that distinguish them from healthy endothelial cells. Designing effective vaccine compositions using these tumor-specific antigens, considering factors like antigen presentation and immune stimulation. Establishing robust methods for evaluating vaccine safety and efficacy, ensuring minimal side effects and optimal anti-tumor activity. A novel vaccine preparation concept, termed "SANTAVAC" (Set of All Natural Target Antigens for Vaccination Against Cancer), is proposed. This approach emphasizes the use of a carefully selected and defined set of natural antigens derived from tumor endothelial cells to maximize the specificity and efficacy of the cancer vaccine. Further studies in animal models are crucial to validate this approach and optimize vaccine formulations, including adjuvant selection and vaccination schedules.

Keywords: Cancer, Immunotherapy, SANTAVAC, Genomics, Formulation, Trials

HEALTHMEDICON/25/PP-017

**PHYTO MICROBEADS: HARNESSING *MIRABILIS JALAPA* FOR STRESS
MANAGEMENT**

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The study explores the formulation and assessment of microbeads formulated from the leaf extract of *Mirabilis jalapa*, known for its different pharmacological actions. Microbeads serve as a promising drug delivery system due to their controlled release characteristics and enhanced bioavailability. This focuses on the anti-stress potential of *Mirabilis jalapa*, attributed to its bioactive constituents such as flavonoids, alkaloids, and phenolic compounds and many more. The preparation methodologies including ionotropic gelation and solvent evaporation were reviewed, emphasizing the selection of polymers like sodium alginate and chitosan for bead efficacy and stability. The characterization techniques such as particle size analysis, swelling behaviour, encapsulation efficiency and in-vitro release studies were critically evaluated to determine the performance of these microbeads. The anti-stress activity was monitored through in-vivo and in-vitro models, demonstrating significant potential in mitigating stress-induced

physiological and biochemical changes. This highlights the scope of *Mirabilis jalapa*-based microbeads as a novel therapeutic approach for stress management, encouraging further research in this domain. It underscores the significance of utilizing natural plant-based extracts in developing sustainable and effective drug delivery systems. By bridging traditional knowledge with modern pharmaceutical advances, *Mirabilis jalapa* microbeads present a promising approach for stress management.

Keywords: Microbeads, *Mirabilis jalapa*, Anti-stress, Sodium alginate, Controlled release

HEALTHMEDICON/25/PP-018

**UNLOCKING THE POTENTIAL OF RNA NANOPARTICLES: A
BREAKTHROUGH APPROACH TO OVERCOMING CHALLENGES IN COLON
CANCER TREATMENT**

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Colon cancer is one of the main causes of cancer-related deaths worldwide. Because of the high potential for metastasis, this type of cancer is difficult and occasionally impossible to treat effectively. Multi-drug resistance (MDR) and side effects are still major obstacles to overcome, even with the advancement of targeted medicines and improvements to traditional chemotherapy. RNA technology has potential as a therapeutic intervention for targeted gene silencing in cancer, and some RNA-based formulations are presently undergoing clinical trials. According to several studies, RNA-based nanoparticles have shown enormous potential for gene therapy, targeted drug delivery, and other biological uses. However, there are significant drawbacks to employing RNA as a medicinal agent, mostly because of its limited cellular absorption and low stability. Given the challenges of safely delivering naked RNA molecules *in vivo*—such as their short half-lives, low chemical stability, and vulnerability to nuclease degradation—nanotechnology provides a versatile and customized substitute. The nanoparticle-based delivery technologies permit RNA accumulation at the tumour location while simultaneously protecting RNA molecules from enzymatic degradation and immune system assaults. This study reviews the current state of mRNA therapeutics, the development of nanomaterials and delivery methods, and the potential of RNA and RNA-associated nanomedicines for the treatment of colon cancer, as well as the opportunities for resolving any issues pertaining to mRNA.

Keywords: Nano-formulation, mRNA, polymer, toxicity, multi-drug resistance (MDR), lipid-based nanoparticles, polymer-based nanoparticles.

HEALTHMEDICON/25/PP-019

DEVELOPMENT AND IN-VITRO EVALUATION OF BILAYER TABLETS CONTAINING METFORMIN HCL AND SITAGLIPTIN USING A QUALITY BY DESIGN APPROACH

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Type II diabetes mellitus is a prevalent chronic condition, often managed with oral medications such as metformin, typically in combination with another agent like sitagliptin, a dipeptidyl peptidase-4 (DPP-4) inhibitor. The commercial product Janumet XR 50/500 mg employs a formulation where the core tablet of extended-release metformin is coated with an immediate-release layer of sitagliptin. However, this coating process increases overall production costs. Therefore, this study aims to develop cost-effective bilayer matrix tablets by incorporating both drugs into separate layers: a sustained-release layer for metformin and an immediate-release layer for sitagliptin. The sustained-release layer was formulated using the wet granulation method with hydroxypropyl methylcellulose (HPMC) and ionic polymers, while the immediate-release layer was prepared using direct compression with sodium-based super disintegrants and compressible fillers. The optimal formulation was designed and characterized using the Design of Experiments (DoE) approach. *In-vitro* drug release studies compared the performance of the bilayer tablets with the reference product Janumet XR 50/500 mg. The optimized bilayer tablet formulation achieved rapid release of sitagliptin (>90%) within 30 minutes at pH 1.2 and sustained the release of metformin over 10 hours at pH 6.8, demonstrating a release profile comparable to the reference product. The developed bilayer tablets present a cost-effective and viable alternative for the combination therapy of type II diabetes.

Keywords: Dipeptidyl peptidase-4 (DPP-4) inhibitor, Hydroxypropyl methylcellulose (HPMC), Bilayer matrix tablets, Design of Experiments (DoE), Type II diabetes mellitus

HEALTHMEDICON/25/PP-020

HERBAL ANTIMICROBIAL OINTMENT: FORMULATION, CHARACTERIZATION AND BIOLOGICAL ACTIVITY EVALUATION

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Globally in primary health care, traditional herbal medicine plays a crucial role. Reports indicate that approximately 70–80% of India's emerging urban and rural populations depend on traditional herbal medicine for health interventions. Furthermore, billions of people globally consume traditional herbal medicine daily in the form of meals, medications, or supplements. Reports showed that traditional herbal medicines have been religiously used to treat or eradicate many diseases and illnesses including gastroesophageal reflux disease. Herbal drugs

are produced not only as tablets for dosage but also as ointments and creams. Medicated ointments are composed of a dissolved medicament that is either dissolved, suspended, or emulsified within a base. Ointments serve multiple purposes when applied topically, including as protectants, antiseptics, emollients, antipruritic agents, keratolytic, and astringents. The prime objective of the present study was to develop and assess the antibacterial ointment from the cinnamon oil, extracted from cinnamon bark. The ointment base was prepared, and the cinnamon oil was incorporated into it in the most effective ratio through titration to formulate the ointment. After the completion of the formulation, quality of the ointment was assessed in terms of irritancy, spread ability, viscosity and ph. The extracted oil was taken in different ratio randomly and the antimicrobial tests were carried out with the aid of disk diffusion against assay *Escherichia coli*. The most effective combination was then determined by comparing the results of the zone of inhibition given by the 3 different ratios on *Escherichia coli*. Further, detailed characterization, stability and biological studies may provide a successful and fruitful herbal ointment.

Keywords: Herbal medicine, ointment, antibacterial, *Escherichia coli*, cinnamon oil.

HEALTHMEDICON/25/PP-021

BIODEGRADABLE POLYMERS IN EDIBLE FOOD PACKAGING: A COMPREHENSIVE REVIEW

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The food business is facing challenges as food scarcity worsens due to growing populations and rising food demand. Polyethylene and polyvinyl chloride are petroleum-based polymers that are frequently used for food packaging and wrapping. Nevertheless, overuse of these polymers poses risks to human health and the environment. Therefore, there is now a lot of research being done on the use of bio-based materials for food packaging. Biodegradable polymers are used to make edible packaging materials, which are safe to use with food. These are compatible with meals and provide additional health benefits to consumers. Food packaging based on films and multilayer coatings has become the focus of recent research since these materials can provide additional distinctive features. The quality of biopolymers is influenced by their mechanical, thermal, barrier, and physical properties. This research highlights the characteristics of various biopolymers and their blends, examines the market potential for food packaging applications, and contrasts the qualities of biopolymers with non-biodegradable polymers. The study also highlights a number of commercial forms for usage as active packaging, modified environment packaging, and edible packaging, including films, trays, bags, coatings, and foamed items. There have been discussions on a wide range of subjects that affect market growth, including customer perception and dangerous products produced during production. These processing methods may be utilised to improve the mechanical and biomaterial barrier properties, as well as to assist extend the overall shelf life of the packaging system through in-pack processing, because biopolymer information is widely distributed across several sources.

Keywords: Edible packaging materials, petroleum-based polymers, biodegradable polymers, processing technologies, shelf life.

HEALTHMEDICON/25/PP-022

GREEN SYNTHESIS, CHARACTERIZATION OF GRAPHENE QUANTUM DOTS FROM LEAVES OF *PHOENIX DACTYLIFERA* FOR IN-VITRO ANTIOXIDANT APPLICATION

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One of the earliest plants that humans have ever grown is the date palm (*Phoenix dactylifera*), a subtropical and tropical tree that belongs to the Palmae (Arecaceae) family. In these semi-arid and dry regions of the globe, especially in Arab nations, date palm is a key agricultural commodity. These trees produce large amounts of agricultural waste from seeds, dried leaves, and other materials. This investigation used Dried date palm leaves as green precursors to create graphene quantum dots (GQDs). GQD was made using simply distilled water and pure ethanol using a hydrothermal process at 200 °C for 12 hours. Together with the morphological, compositional, and optical investigation of the sustainably produced GQDs, the compositional analysis of the leaf extract was carried out. The effective creation of GQDs, with typical diameters ranging from 3.5 to 8 nm, was validated by the characterization findings. In addition to helping with large-scale manufacturing and the recycling of date palm tree waste products from middle Eastern nations into value-added goods, this research aids in the inexpensive, environmentally beneficial, and biocompatible acquisition of GQDs. For antioxidant studies, DPPH and phospomolibodinum assay method with several dilution was used. *In vitro* antioxidant studies indicate that the biological efficacy of synthesized GQDs was higher than the ethanolic leaf extract.

Keywords: Graphene quantum dots, Palm tree, Fluorescence, Antioxidant, Graphene quantum dots, DPPH

HEALTHMEDICON/25/PP-023

HEAVY METAL HAVOC: DECIPHERING THE CELLULAR MECHANISMS OF CADMIUM TOXICITY

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Cadmium (Cd) is a heavy metal pollutant that is everywhere and is a big risk to health and the environment. The main sources of Cd pollution are drinking water, contaminated food, smoking cigarettes, extracting and processing minerals, industrial uses, and the common use of Cd batteries. Cd gets into cells mostly through the passive diffusion and active transport using divalent metal transporters (DMTs). Once inside, Cd builds up in different cell organelles like the cytoplasm, endoplasmic reticulum (ER), mitochondria, and nucleus. The mechanism of how Cd spreads inside the cells is crucial for understanding the negative effects caused by Cd exposure. The toxicity of Cd mainly results from oxidative stress due to free radicals formed from oxygen and nitrogen, such as H₂O₂, HO•, O₂•-, RO•, ROO•, NO•, NO₂•, and ROO•. This oxidative stress can lead to lipid damage, protein harm, and changes in the DNA strands,

causing cell dysfunction and apoptosis. Cd can also affect various signalling pathways such as MAPKs, NF-κB, JNK, and p53, worsening the cell damage process.

Keywords: Cadmium, divalent metal transporters, endoplasmic reticulum, oxidative stress, signalling pathways

HEALTHMEDICON/25/PP-024

WALNUT: A FUNCTIONAL FOOD FOR DISEASE PREVENTION AND HEALTH PROMOTION

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Walnut, classified as a functional food, also considered as a high-density nutrient dry fruit due to rich composition of bioactive compounds, including omega-3 fatty acids, antioxidants, polyphenols, and dietary fiber. These components not only nourish the body but also contribute to the prevention of chronic diseases and overall health promotion. Walnuts are present in FAO's priority list because of their immense nutritional properties. Walnuts have significant potential in reducing the risk of cardiovascular disorders by improving lipid profiles and lowering inflammation. Their neuroprotective properties support cognitive function, making them a valuable dietary addition for ageing population. Walnut also helps in managing metabolic conditions such as type 2 diabetes by enhancing insulin sensitivity. Recent studies suggest the role of walnut in fostering a diverse gut microbiota, essential for gastrointestinal health and immunity. Fiber content in walnuts can help promote digestive health and prevent constipation. The anti-ageing effects of walnut extracts can prevent oxidative damage, inflammation, tumor growth, wrinkles. Walnut is a good source of several minerals including calcium phosphorus which supports bone health. By advancing research on walnuts and their applications, one can discover further opportunities to utilize functional foods in achieving better public health outcomes.

Keywords: Walnuts, Functional Foods, Bioactive Compounds, Neuroprotective Properties, Gut Microbiota.

HEALTHMEDICON/25/PP-025

GREEN SYNTHESIS OF SILVER NANOPARTICLES (AGNPs), STRUCTURAL CHARACTERIZATION, AND THEIR ANTIBACTERIAL POTENTIAL

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Silver nitrate was used as a metallic precursor and the extract of *Moringa oleifera* leaves i.e. different in concentration was used as well as reducing or capping agent. By rapid reduction of silver ions, the extract exhibited strong potential ions for the synthesis of silver nanoparticles. The resulted silver nanoparticles were characterized by following techniques, such as UV-visible spectroscopy, X-ray diffraction (XRD), and scanning electron microscopy (SEM) techniques. The absorption SPR peaks appeared in the range of 415 to 439 nm. By SEM

techniques, particles shape will be spherical, and size will be ranging from 10 nm to 25 nm. After synthesis, silver nanoparticles were pure crystalline in nature and confirmed by XRD spectra where avg crystal size will be 7 nm. *In vitro* antibacterial activity of the prepared silver nanoparticles colloidal samples as well the extract was studied using different concentrations of AgNPs (C1 = 100 µg/ml, C2 = 50 µg/ml, C3 = 25 µg/ml) by well diffusion method against Gram negative Escherichia coli. The antibacterial performance was assessed by measuring the zone of inhibition (ZOI).: The results suggested that AgNPs prepared by green approach can be considered as an alternative antibacterial agent.

Keywords: *Moringa oleifera*, AgNPs, antibacterial agent, Escherichia coli, green synthesis

HEALTHMEDICON/25/PP-026

EDIBLE BERRIES A FUNCTIONAL FOODS: EXPLORING THEIR NUTRITIONAL IMPACT ON HUMAN HEALTH

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The increasing awareness of the critical role of nutrition in human health has significantly enhanced consumer interest in nutraceuticals like foods rich in beneficial compounds, particularly present in fruits and vegetables. Fruits like edible berries have several potential health benefits and are known to have powerful antioxidants, especially anthocyanins. These antioxidants also help in reducing the risk of cardiovascular disorders reducing oxidative stress associated with ageing, controlling inflammatory reactions, and possibly averting several degenerative illnesses. These edible berries have also demonstrated their ability to protect the integrity of genomic DNA, improving neuronal and cognitive function, and fostering ocular health. Free radicals and reactive oxygen species (ROS) are produced naturally as by-product of several physiological functions and can significantly damage our body's cellular structures, including lipids, proteins, and DNA. Edible berries provide vital exogenous assistance for the body's endogenous antioxidant defence against these harmful free radicals. The pathophysiology of chronic diseases, such as diabetes, inflammatory disorders, and cardiovascular disorders, is closely linked to imbalances in antioxidant defence mechanisms. The antioxidants present in these edible berries efficiently scavenge dangerous free radicals and guard against oxidative stress. Notably, it has been demonstrated that berry extracts can prevent LDL oxidation, a major contributor to cardiovascular disorders. Beyond their antioxidant properties, berries also support a healthy immune system. Their versatility makes them ideal functional food for the food industry, enabling the development of innovative and wholesome products that promote overall health.

Keywords: **Edible Berries, Antioxidants, Free Radicals, Oxidative Stress, Functional Food**

HEALTHMEDICON/25/PP-027

A NOVEL CHITOSAN-PEG HYDROGEL EMBEDDED WITH *IN SITU* SILVER NANOPARTICLES OF *CLERODENDRUM GLANDULOSUM* LINDL. EXTRACT: EVALUATION OF ITS *IN VIVO* DIABETIC WOUND HEALING PROPERTIES USING AN IMAGE-GUIDED MACHINE LEARNING MODEL

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Chronic wounds, which are mainly associated with diabetic mellitus, cause a variety of problems, including hyperglycemia. The various symptoms include decreased synthesis of growth factors, reduced migration and proliferation of keratinocytes, decreased synthesis of angiogenesis and cytokines, decreased synthesis of matrix metalloproteinase (MMP), neuropathy, decreased synthesis of nitric oxide synthase, reduced migration and synthesis of fibroblasts, as well as impaired functions of inflammatory cells, so to overcome this multifaceted mechanical problem of diabetic wounds needs a new topical formulation that absorbs wound exudates, prevent secondary infections, and administer the active ingredient in a controlled manner is required to address the complex mechanism of diabetic wounds. Thus, to satisfy the preceding parameter, the *Clerodendrum glandulosum* (CG) extract reduced silver nanoparticle (AgNP) soaked polyethylene-chitosan glycol (PEG) hydrogel was formulated. The experimental studies find that hydrogel displays good formulation characteristics and demonstrated controlled release for 168 hours, making it appropriate for chronic wound healing studies. The follow-up investigations show that this formulation had the least cytotoxic properties, potent antioxidant and antimicrobial properties, and good hemocompatibility. The investigational findings revealed that it enhanced extracellular matrix production and a quicker rate of wound closure. These antimicrobial, antioxidant, wound-healing, and anti-inflammatory properties suggest that the CG-AgNP-loaded chitosan–PEG hydrogel appears to be a viable ingredient for new topical diabetic wound formulations.

Keywords: *Clerodendrum glandulosum* Lindl., Silver nanoparticles, Diabetic wounds, Chitosan, Hydrogel

HEALTHMEDICON/25/PP-028

A REVIEW ON THE ROLE OF THE MARINE PHARMACOGNOSY IN DRUG DISCOVERY

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Medical research has significantly advanced in enhancing both lifespan and quality of life. Nonetheless, we continue to encounter obstacles related to various incurable diseases, the emergence of resistance to existing treatments, and the scarcity of novel drug development sources. Marine pharmacognosy is an emerging discipline that investigates the many chemical compounds obtained from aquatic organisms for potential use in drug discovery and

development. The oceans, encompassing over 70% of the Earth's surface, host a remarkable variety of living forms, including sponges, mollusks, algae, fungi, and bacteria, many of which synthesize bioactive substances as natural defensive mechanisms. Marine pharmacognosy exhibited a pivotal role in drug development. Marine creatures are acknowledged as a valuable source of structurally distinct metabolites, including polyketides, alkaloids, peptides, and terpenoids, exhibiting significant medicinal properties. Numerous marine-derived chemicals, such as trabectedin, ziconotide, and eribulin, have been effectively transformed into authorized pharmaceuticals, illustrating the considerable promise of marine pharmacognosy in fulfilling unmet medical requirements. Marine natural component can provide novel chemical structure, which can lead to the develop of new drugs with improved efficacy and safety profiles. Marine derive compound can treat various diseases such as cancer, infection diseases, and inflammatory disorder. Example of the marine drug is ziconotide, this is a painkiller derive from the venom of the cone snail. Eribulin a chemotherapy drug derives from the marine sponge Halichondriaokadai. Omega-3-fatty acids derive from the marine fish and algae, this fatty acid has the anti-inflammatory properties and are used to treat cardiovascular disorder.

Keyword: Novel Drug, Marine Pharmacognosy, Drug Discovery, Bioactive Substance, Ziconotide.

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NANOTECHNOLOGY IN DRUG DISCOVERY

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The utilization of different nanoparticles as carriers in nanotechnology is the most recent innovation in drug delivery technology. Conventional drug administration routes include oral, buccal, rectal, subcutaneous, intranasal, intramuscular, intravenous, pulmonary, and transdermal. Although these methods are widely used to treat a wide range of illnesses, they have some disadvantages, such as instability, the potential for displacement, uncontrolled release, discomfort and irritation as side effects, slow absorption, enzymatic destruction, and many more. Adding medications to nanocarriers is one of the best ways to deliver them in a targeted and long-lasting manner. Nanocarriers are stable and biocompatible. These are used as novel diagnosis tools or therapy agents or to treat diseases via site-specific and targeted delivery of particular therapeutics. This review paper describes how to use nanocarriers including carbon nanotubes, virus-like particles, solid nanoparticles, liposomes, dendrimers, polymeric nanoparticles, polymeric micelles, and mesoporous silica nanoparticles. This review highlighted the importance of nanocarrier for drug delivery and how they manage different types of diseases. This study also focused on the recent advancements of nanocarriers-based delivery systems, including polymeric nanocarriers, micelles, nanotubes, dendrimers, magnetic nanoparticles, and solid lipid nanoparticles. The challenges and future aspects of nanocarriers' drug delivery system are also presented.

Keywords: Nanocarriers, Carbon nano tube, Uncontrolled release, Biocompatible, Site specific

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**A COMPREHENSIVE REVIEW OF THE PHYTOCHEMICAL,
PHARMACOLOGICAL AND TOXICOLOGICAL PROPERTIES OF ANNONA
MURICATA L.**

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Annona muricata L. (Magnoliales: Annonaceae), commonly known as soursop, is a tropical plant renowned for its edible fruit and diverse medicinal properties. This review delves into the phytochemical composition, biological activities, and toxicological aspects of its extracts and isolated compounds, with a focus on stimulating further studies on its therapeutic potential. Traditionally, *A. muricata* has been used to treat a range of ailments, including fever, pain, respiratory and skin diseases, parasitic infections, bacterial infections, hypertension, inflammation, diabetes, and cancer. Over 200 chemical compounds, notably alkaloids, phenols, and acetogenins, have been identified in this plant. Pharmacological studies reveal that extracts and compounds from *A. muricata* exhibit antimicrobial, anti-inflammatory, antioxidant, anti-protozoan, and cytotoxic activities. In vivo investigations further highlight properties such as anxiolytic, anti-stress, anti-tumoral, antiulcer, wound healing, hepatoprotective, and hypoglycemic effects, supported by clinical evidence for the hypoglycemic activity of its ethanolic leaf extracts. However, certain compounds display neurotoxic effects, underscoring the need for extensive research to determine their safety, optimal dosages, mechanism of action, and long-term effects. This review emphasizes the therapeutic potential of *A. muricata* while advocating for comprehensive studies to validate its clinical applications and address safety concerns.

Keywords: *A. muricata*, pharmacology, diabetes, anti-diabetic, metabolite changes.

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**ARTIFICIAL SWEETENERS AND CANCER: EVALUATING RISKS AND THE
POTENTIAL OF STEVIA AS A NATURAL ALTERNATIVE**

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Use of artificial sweeteners has been increasing in many areas over time. These are chemically synthesized substances, used to sweeten foods and beverages instead of sucrose (table sugar). Because they are many times sweeter than table sugar, much less (200 to 20,000 times less) is needed to produce the same level of sweetness. Acesulfame potassium, Aspartame, Advantame, Neotame, Sucratose, and most Saccharin are used as artificial sweeteners in chewing gum and toothpaste. Concerns about artificial sweeteners and cancer first arose when early studies linked the combination of Cyclamate and Saccharin to the development of bladder cancer in animals, especially male rats. Most studies about other approved artificial sweeteners have found no evidence that they cause cancer or other adverse effects in lab animals. Laboratory studies have linked high doses of Saccharin to the development of bladder cancer in rats. In 1981 “US National Toxicology Program” report on Carcinogens listed saccharin as a substance with a

reasonable possibility of being a carcinogen. The results of these studies are inconsistent. The "N'utriNet-Sante Study", conducted in France, looked at the intake of artificial sweeteners from all diets and observed that those who consumed them the most had a slightly higher incidence of cancer than those who did not. A clinical trial showed that obese and overweight adults who consumed beverages containing Saccharin and Aspartame significantly increased their body weight. Therefore, steviol glycosides obtained from the leaves of *Stevia rebaudiana* (stevia) can be used as a natural sweetener, which is 240 times sweeter than sugar, it is safe at an intake of 4 mg/kg body weight/day and has no evidence of Carcinogenicity, Genotoxicity, Developmental toxicity.

Keywords: Artificial sweeteners, Obesity, Carcinogens, Stevia, Cancer

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DRY POWDER INHALERS FOR PULMONARY DRUG DELIVERY OF ASTHMA

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Acute severe asthma is characterized by a significant decline in expiratory airway flow and worsening respiratory symptoms, requiring prompt intervention. Dry powder inhalers (DPIs) play a vital role in asthma management by enabling rapid delivery of medications directly to the lungs. Unlike metered-dose inhalers that use propellants, DPIs rely on the patient's inhalation effort to disperse powdered medications such as bronchodilators and corticosteroids. Clinical studies indicate that DPIs are effective during acute asthma episodes, providing quick relief and improving pulmonary function. The advantages of DPIs include ease of use, elimination of the need for coordination between actuation and inhalation, and breath-actuated delivery that enhances patient compliance. However, challenges remain, such as variability in patient adherence, device-specific usage nuances, and the requirement for proper inhalation techniques to ensure optimal drug deposition. Future research focusing on enhancing DPI formulations, optimizing device designs, and improving patient education could expand their utility in asthma management, leading to better disease control and improved quality of life for individuals with asthma.

Keywords: Acute severe asthma, Dry powder inhalers (DPIs), Bronchodilators, Inhalation techniques

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HUMAN METAPNEUMOVIRUS OUTBREAK

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HMPV is a common respiratory virus that was discovered in 2001, an accentuated announcement during the period 2021-2025. Because of the sudden rise in cases started in China and now 8 cases in India till date, so, it is necessary having a drug design strategy to find

its cure. This virus is a causative agent for both upper and lower respiratory tract infections in children under 5 years and adults over 65 years. Its clinical behavior is like influenza and Respiratory Syncytial Virus (RSV). It is classified into two types as hMPV-A and hMPV-B genotypes. The Epidemiological information shows hMPV-A achieved 90% of predominance in recent years. It is more active in spring and winter months. Though there is no exact drug or vaccine present to eradicate the virus, several research are on the current verge like development of a novel multi-epitope mRNA vaccine candidate to combat. Moreover, supportive treatments like immunoglobulins, glucocorticoids, and other symptomatic treatment methods are considered as solutions against hMPV infection. Risk factors associated with severe hMPV infection include, pre-existing nosocomial infection, premature birth and underlying chronic pulmonary, heart, or neural disorders. Since the rapid rise in cases is a medical burden, it is important to conduct more studies and discovering the remedies like potential drugs and vaccines.

Keywords: HMPV, Epidemiological information, multi-epitope mRNA vaccine, drug design strategy, nosocomial infection.

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BIO MEDICAL WASTE & ITS MANAGEMENT

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Infectious and dangerous elements are included in biomedical waste (BMW), which is produced in industry and healthcare facilities. It is made up of solid or liquid waste that may be infectious or hazardous, such as waste from laboratories, research, or medical settings. Infections among medical staff, patients, and the community at large, as well as environmental contamination, can result from improper BMW management. General, pathological, radioactive, chemical, infectious, sharps, medicines, and pressured wastes are some of the classifications for BMW. For the safe handling and disposal of BMW, India's Biomedical Waste Management Rules, 2016 (BMWM Rules, 2016) offer a thorough framework. The regulations include colour coding, container types, and labelling standards for BMW containers in addition to outlining the procedures for segregation, transit, and disposal. Additionally, they set requirements for waste treatment facilities including autoclaves and incinerators. The new regulations in India are intended to enhance BMW treatment, transportation, disposal, and segregation. Since BMW has the potential to pollute the air, water, and land if improperly managed, this appropriate management is meant to reduce environmental contamination. Effective BMW disposal requires a lot of cooperation as well as dedicated government funding and infrastructure development support. Devoted healthcare facilities and personnel are also important. Furthermore, it is imperative that BMW be properly and consistently monitored. Thus, creating eco-friendly practices as well as the appropriate strategy and procedures for BMW disposal is crucial to achieving the objective of a clean and green environment.

Keywords: Biomedical waste, Biomedical Waste Management Rules, Segregation, Disposal, Treatment, Eco freindly

HEALTHMEDICON/25/PP-035

EXTENSION OF PATENT EXCLUSIVITY IN DEVELOPING COUNTRIES

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From the given articles of the TRIPS Agreement, numerous effects have been shown on the implicit low costs of medicines and benefits of the stronger intellectual property Rights (IPRs) protection in terms of growth and technology transfer, particularly for developing countries like India. By extending the patent exclusivity, it encourages companies to study and develop new medicines by not risking the extended time and efforts expended during the development. This is especially important for medicines in understudied areas, similar as rare conditions, antibiotics, and pediatric populations.

Keywords: TRIPS Agreement, Intellectual property rights (IPRs), Patent

HEALTHMEDICON/25/PP-036

**QUANTUM DOTS: AIMING TO REVOLUTIONIZE BIOIMAGING AND
BIODIAGNOSTICS**

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Semiconductor quantum dots (QDs) are light-emitting particles on the nano meter scale ranging between 1 to 12 nm, that have emerged as a new class of fluorescent labels for chemical analysis, molecular imaging, and biomedical diagnostics, which has resulted in a significant boom in the field of nanotechnology. In comparison to traditional fluorescent probes, QDs have unique optical and electronic properties, viz. size-tunable light emission, narrow and symmetric emission spectra, and broad absorption spectra, enabling their simultaneous excitation of multiple fluorescence colours. QDs are also relatively brighter and more photo-resistant than organic dyes and fluorescent proteins. These features make them ideal for dynamic imaging at the single-molecule level as well as ultrasensitive multiplexed biological diagnostics. The fundamental features of QDs, the development of next-generation QDs, and its applications in bioanalytical chemistry, dynamic cellular imaging, and medical diagnostics will be explored. QD toxicity might have been considered a serious concern in in vivo and clinical imaging, yet the toxic nature of cadmium-containing QDs is no longer a factor for in vitro diagnostics, consequently, the use of multicolour QDs for molecular diagnostics and pathology is probably the most important and clinically relevant application for semiconductor QDs in the proximate graspable future. Quantum dots have made remarkable advancements in bioimaging, biodiagnosis and bioanalysis. The progress encompasses safer, cadmium-free options, increased stability, and higher quantum efficiencies. Obstacles such as toxicity and scalability exist, advances in synthesis, surface modification, and eco-friendly materials push their incorporation into a wide range of applications in technology and medicine.

Keywords: Quantum dots, Biomedical applications, Nanoprobes, Theragnostic platforms

HEALTHMEDICON/25/PP-037

**A COMPARATIVE INVESTIGATION OF ANTIOXIDANT POTENTIAL IN
METHANOLIC AND ETHANOLIC EXTRACTS OF *MIKANIA MICRANTHA*
LEAVES**

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Mikania micrantha Kunth has become widely distributed across the Pacific region and Southeast Asia. Traditionally, *M. micrantha* is used to treat ailments such as stomach aches, respiratory diseases, dysentery, and rheumatism. The plant is also consumed as a juice, offering an alternative medicine for managing diabetes, hypertension, and hypercholesterolemia. Previous studies have highlighted a range of health benefits associated with *M. micrantha*, including antioxidant, anti-diabetic, anti-cancer, anti-inflammatory, and antibacterial properties. These therapeutic effects are attributed to its rich chemical composition, which includes terpenoids, flavonoids, alkaloids, glycosides, polyphenols and tannins. The literature review indicates that the methanolic extract of *Mikania micrantha* demonstrates significantly better results compared to the ethanolic extract. In terms of phytochemical analysis, antioxidant activity, total phenolic content (TPC), and total flavonoid content (TFC), the methanolic extract shows notably higher levels across all parameters. On the other hand, Oxidative stress occurs due to an excess of reactive oxygen species (ROS), such as superoxide, hydrogen peroxide, and hydroxyl radicals. This imbalance plays a major role in the development of CVDs, including ischemic heart disease, atherosclerosis, heart failure, cardiomyopathy, and arrhythmia etc. In chronic diseases increased free radicals trigger oxidative stress and inflammation, leading to complications and worsening overall health. The methanolic extract of *Mikania micrantha* leaves comprises significant quantity of polyphenols and antioxidant potential. As a result, research is increasingly focused on natural antioxidants that can help manage the chronic diseases like diabetes, cardiomyopathy, ischemic heart disease, atherosclerosis etc. Further studies will explore the beneficial pharmacological actions with methanolic extract ameliorating the chronic disease conditions modulating through its significant antioxidant property.

Keywords: *Mikania micrantha*, methanolic extract, phenolic acid, flavonoid antioxidant

HEALTHMEDICON/25/PP-038

**ANALYTICAL METHOD DEVELOPMENT AND VALIDATION OF AN HPLC
METHOD FOR THE ESTIMATION OF CURCUMINOIDS AND RELATED
COMPOUNDS IN EXTRACT OF *CURCUMA CAESIA***

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Curcuminoids, including curcumin, demethoxycurcumin, and bisdemethoxycurcumin, are non-toxic polyphenolic compounds known for their diverse biological activities. Found in Curcuma species, these compounds exhibit significant therapeutic properties. *Curcuma caesia* (Black Turmeric), a perennial herb native to Northeast and Central India, is distinguished by its bluish-black rhizomes and traditional use in treating ailments such as muscle pain, asthma, leprosy, cancer, epilepsy, and hemorrhoids. The plant demonstrates antioxidant, anti-inflammatory, antimutagenic, antibacterial, and antifungal properties, while also acting as a laxative and a tonic for the brain and heart. Research shows that methanolic extracts of *Curcuma caesia* can reduce cyclophosphamide-induced toxicity in mice, protecting bone marrow, liver, and kidney cells. Additionally, synthesized gold nanoparticles (GNPs) derived from the plant have shown promise against breast cancer cell lines. In traditional Indian medicine, *Curcuma caesia* has been used to address asthma, tumors, bronchitis, and wounds, underscoring its therapeutic potential and the need for further pharmacological exploration. This study aimed to develop and validate a robust bioanalytical method for quantifying curcuminoids using a reverse-phase high-performance liquid chromatography (RP-HPLC) approach guided by Quality by Design (QbD) principles. The method was optimized for sensitivity, speed, and reproducibility, enabling precise pharmacokinetic and bioavailability assessments. Such advancements support a deeper understanding of curcuminoids' therapeutic applications and establish *Curcuma caesia* as a valuable resource in herbal medicine and modern pharmacological research.

Keywords: Method development, Validation, *Curcuma caesia*, RP-HPLC, polyphenolic compounds

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ADVANCEMENTS IN THE MANAGEMENT OF MYOPIA

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Myopia is a relatively common disorder that usually begins in childhood and is often referred to as near-sightedness or short-sightedness. There are several ways to manage and control myopia, but it is obvious that the key to decreasing the condition's rapid rise in prevalence worldwide will be to understand the variables that delay the start of myopia and limits its advancements. Since myopia is linked to the emergence of major pathological illnesses such macular degeneration, retinal detachments, glaucoma, and cataracts, there has been a recent surge in efforts to slow its advancement. The goal of myopia management is to minimize myopia and lower your chance of acquiring a serious eye condition that could cause blindness. There is evidence that managing myopia can slow its advancement by as much as 78%. Myopia

can be managed with the help of eyeglasses, contact lenses, and eye drops, all of which have been shown in studies to help slow the growth of myopia. The need for effective myopia prevention strategies is justified by the rising prevalence of myopia in the world. The deficiency of certain nutrients is linked with the development of myopia, these include vitamin A, vitamin B2, vitamin C, vitamin D.

Keywords: Myopia, Management, Prevention.

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THE INFLUENCE OF GENETIC AND ENVIRONMENTAL FACTORS ON MYOPIA DEVELOPMENT

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Myopia, a primary cause of vision impairment, has become a major global concern in recent decades due to its fast-rising incidence and prevalence, it is a condition of refraction which occurs when parallel light rays focus in front of a resting eye's retina. Environmental influences and genetic predispositions interact intricately to determine its development. In recent times, hereditary aspect of refractive defects has been highlighted by genetic investigations that have shown many loci linked to myopia. At the same time, myopia is accelerated by environmental variables such as urbanization, limited outside exposure, and extended near-work activities, particularly during childhood. The genetic foundation of myopia also offers vital information for identifying those who are at risk early on and creating focused treatment to halt its growth. Moreover, Children with myopic parents are at a much higher risk because myopia frequently runs in families, and in research on identical twins has revealed high myopia concordance rates, suggesting a significant genetic component. Ethnic groups also differ in their genetic susceptibility to myopia; East Asian populations are more likely to have it than European or African ones. Certain environmental factors also influence on myopia development such as lack of vitamin D has been associated with increased myopia risk. Hence, a balanced diet with sufficient vitamins and antioxidants supports overall eye health. To address the increasing worldwide burden of myopia, effective preventative and management measures must consider these intricate linkages.

Keywords: Myopia, Genetics, Environmental Factors

HEALTHMEDICON/25/PP-041

FERTILITY ENHANCING HERBAL DRUGS FROM NATURAL SOURCES IN WEST BENGAL

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One in six couples worldwide struggle with infertility, which is still stigmatised in society, especially for women without children. Effective and easily available treatments are crucial since this deeply rooted problem frequently causes emotional and societal difficulties. Around 75% of people worldwide now use herbal medications for their basic medical needs, reflecting

their recent rise in popularity. Men have been using herbal medicines for thousands of years, and their benefits—such as their accessibility, compatibility with regional customs, personal preferences, and the growing popularity of natural and organic products—have been well-documented. For thousands of years, traditional medicine in West Bengal, India, has relied heavily on the region's rich botanical legacy. There are several medicinal plants in the state that are used to treat gynecological and sexual diseases. The region's traditional healers are quite knowledgeable on how to prepare and use these plants. They place a strong emphasis on exact dosages, particular administration techniques, and any dietary or lifestyle restrictions that may be required during treatment. Furthermore, they are skilled in guaranteeing the security and effectiveness of these treatments. The relevance of medicinal plants in West Bengal is the main subject of this study, which also explores their traditional uses and possible advantages in treating a range of illnesses, especially those related to sexual and reproductive health.

Keywords: Infertility, Herbal medicines, Traditional healers, Botanical legacy, Sexual health

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POLYPHENOLS: THE EMERGING NUTRACEUTICALS FOR HOLISTIC WELLNESS

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Plant polyphenols have attracted considerable attention because of their key roles in preventing many diseases, including high blood sugar, high cholesterol, and cancer. A variety of functional foods have been designed and developed with plant polyphenols as the main active ingredients. The exceptional functionality and biocompatibility of the polyphenols have stimulated the interest of researchers to use them as building blocks in functional foods, supplements, cosmetics, and drugs. Polyphenols mainly come from vegetables and fruits and can generally be divided according to their structure into flavonoids, astragalus, phenolic acids, and lignans and has different molecular structures and various biological activities including antioxidant, anti-inflammatory, and anticancer properties. However, many polyphenolic compounds have low oral bioavailability, which limits the application of polyphenols in nutraceuticals. Fortunately, green bio-based nanocarriers are well suited for encapsulating, protecting, and delivering polyphenols, thereby improving their bioavailability. In this paper, the health benefits of plant polyphenols in the prevention of various diseases are summarized, with a review of the research progress into bio-based nanocarriers for the improvement of the oral bioavailability of polyphenols. Polyphenols have great potential for application as key formulations in health and nutrition products.

Keywords: Polyphenols, Nutraceuticals, Holistic wellness, Antioxidants, Functional foods.

HEALTHMEDICON/25/PP-043

FLAVONOIDS AND BRAIN HEALTH: EXPLORING THE NEUROPROTECTIVE EFFECTS

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The most prevalent class of polyphenolic chemicals in the human diet are flavonoids, a naturally occurring compound which are mostly present in plants. Grains, fruits, vegetables, fruit juices, tea and wine are the main dietary sources of flavonoids. Flavonols, flavones, isoflavones, flavanones, and anthocyanidins are the major subclasses of flavonoids. Flavonoids exert several health benefits and one of which is their potent effects on mammalian cognition and their ability to help prevent neuronal loss due to age-related neurodegeneration and memory decline. It is increasingly recognized that mental and physical health are related, and that cognitive performance will have a significant impact on general well-being since it is a major factor in the development and maintenance of mental health. The highest potential to influence cognitive processes appears to be found in foods high in three distinct flavonoid subgroups: flavanols, anthocyanins, and/or flavanones. Through their distinct interactions with the Extracellular signal regulated kinase (ERK) and Akt signaling pathways, they may strengthen and increase the number of synapses between neurons, which would raise the levels of neurotrophins like Brain Derived Neurotrophic Factor (BDNF). Their impacts on the cerebral and peripheral vascular systems may also improve cognitive function by increasing blood flow to the brain and stimulating hippocampal neurogenesis. Other neuroprotective effects of flavonoids include activating critical signalling cascades and reducing oxidative stress by scavenging free radicals. Flavonoid consumption is a promising therapeutic avenue for preventing, reducing the cognitive loss and degradation that accompany several brain illnesses.

Keywords: Flavonoids, Brain health, Neuroprotective effect, Cognitive function, Brain illness

HEALTHMEDICON/25/PP-044

APPLICATION OF THE QBD APPROACH IN THE ANALYTICAL METHOD DEVELOPMENT AND VALIDATION OF POLYPHENOLIC COMPOUNDS IN KIWI FRUIT EXTRACTS BY RP-HPLC

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Despite having a high concentration of phytochemicals, particularly phenolic compounds and ascorbic acid, kiwi fruit (*Actinidiachinensis* Planch.) seeds are underutilized and frequently regarded as a by-product in the food and pharmaceutical industries. Caffeic acid, gallic acid, syringic acid, chrysin acid, salicylic acid, ferulic acid and protocatechuic acid are important phytochemicals. In order to precisely estimate syringic acid and chrysin acid from kiwi fruit extracts, this study focuses on creating a bioanalytical technique using reverse-phase high-performance liquid chromatography (RP-HPLC). In addition to its positive effects on glycemic and lipid levels, kiwi fruit is well-known for its wide range of biological activities, including

anti-inflammatory, anti-microbial, anti-viral, anti-diabetic, anti-tumor, and anti-ulcer qualities. Despite being rich in these phytochemicals, kiwi peels and cores are usually thrown away. While syringic acid is used in a variety of industrial activities, such as bioremediation and detoxification, chrysin acid is recognized for its anti-inflammatory and anti-cancer qualities. Enhancing the extraction of these advantageous chemicals for better uses in human health is the goal of this study. The technique created will be useful for bioavailability assessments and pharmacokinetic investigations, encouraging a more efficient use of kiwi fruit by-products. All things considered, this study emphasizes the possible medical advantages and commercial uses of phytochemicals obtained from kiwi fruit.

Keywords: Analytical method development, validation, kiwi fruit, RP-HPLC, polyphenolic compounds

HEALTHMEDICON/25/PP-045

SPROUT YOUR WAY TO WELLNESS: DISCOVER THE BENEFITS OF SEED ANTIOXIDANTS

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Seed antioxidants are bioactive chemicals naturally found in seeds that possess strong free radical scavenging and antioxidant properties, offering protection against oxidative stress, inflammation, and cellular damage, while enhancing general health and well-being. The capacity of antioxidants to neutralize free radicals and reduce oxidative stress is a critical aspect of nutraceuticals, as they offer health benefits and protect against chronic diseases. Seeds like flax, sunflower, pumpkin, poppy, sesame, chia, etc. have antioxidants that have drawn a lot of interest as promising nutraceuticals driven by their possible health advantages. Neutraceutical are food-derived products, that provide health benefits in addition to nutrition. Antioxidants found within seeds, like vitamin E, selenium, and polyphenols, have been linked to numerous health advantages, such as lowering inflammation, enhancing heart health, and boosting immunity. Seed antioxidants may also work synergistically with other nutrients, such as omega-3 fatty acids and fiber, to boost antioxidant activity and give additional health advantages as compared to other sources of antioxidants. A comprehensive strategy for antioxidant protection that supports general health, and well-being can be achieved by including seed antioxidants in one's diet. Frequent intake of antioxidants from seeds may also improve mental clarity, increase vitality, and promote a balanced, healthy lifestyle.

Keywords: Seed, Antioxidant, Neutraceutical, Cellular damage, healthy lifestyle

HEALTHMEDICON/25/PP-046

MICROALGAE-BASED DRUG DELIVERY SYSTEMS IN BIOMEDICAL APPLICAATIONS

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After decades of significant advancements, current drug delivery methods encounter challenges such as cytotoxicity, immunogenicity, and inefficient drug loading, limiting their effectiveness across various systems. Microalgae, as a natural resource, are abundant in bioactive compounds and exhibit unique biological characteristics, including active surfaces, photosynthetic capabilities, and superior biocompatibility. These attributes position microalgae as promising candidates for targeted drug delivery vehicles, with substantial potential in diagnosing and treating a wide range of illnesses. Leveraging the unique traits of microalgae for medicinal delivery is crucial. Their biocompatibility ensures minimal adverse immune responses, while their ability to undergo surface modifications enhances the precision of targeted delivery. Additionally, their photosynthetic nature offers an eco-friendly advantage, contributing to sustainability in biomedical applications. As naturally occurring biomaterials, microalgae hold immense potential for both commercial and clinical applications, offering transformative solutions in modern medicine and healthcare innovation. Recent studies have demonstrated the efficacy of microalgae-based nanoparticles in drug delivery systems, highlighting their low toxicity, biodegradability, and large surface area. Furthermore, microalgae have been utilized in the development of orally deliverable strategies, improving the bioavailability of loaded drugs. So, in this study we aim to elucidate the biological properties of microalgae and their applications in medication delivery, emphasizing innovative approaches for effective drug loading and precise targeted administration.

Keywords: Microalgae, Drug delivery, Biocompatibility, Biomaterials, Targeted administration.

HEALTHMEDICON/25/PP-047

BIOPESTICIDES FROM NATURAL SOURCES

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The environment, non-target plants, animals, and people are all seriously endangered by synthetic pesticides, which are employed to manage pests in agriculture and public health. They frequently result in issues including environmental contamination, pest resistance, and detrimental impacts on biodiversity. So more environmentally friendly substitutes, including biopesticides, has increased as a result of these problems. Biopesticides, which are made from natural sources such as plants, animals, minerals, etc. provide a sustainable way to manage pests while reducing risks to the environment and human health. Plant-based biopesticides, especially extracts and essential oils, have become popular for controlling insects because of their various modes of action and intricate chemical makeup. By acting as attractants, repellents, or anti-feedants, these organic substances can alter the behavior and life cycles of

pests. While some chemicals have larvicidal and ovicidal properties that reduce the emergence of adult insects, others hinder respiration or make it difficult to identify the host plant. These systems reduce the possibility of resistance development while effectively controlling pests. The commercialization of a few pesticides based on essential oils demonstrates their potential. Their widespread acceptance is hampered because of high costs, limitations with large-scale production, their milder effect when compared to synthetic pesticides, and the absence of standardized formulations. Furthermore, many nations' regulatory frameworks place restrictions on the use and approval of biopesticides. So, biopesticides have great promise for the future because of their modes of action, chemical diversity, and environmentally favorable qualities, which establish them as essential instruments for sustainable pest control.

Keywords: Environmental contamination, Synthetic pesticides, Biopesticides, Plant-based extracts, Pest resistance, Sustainable pest control

HEALTHMEDICON/25/PP-048

GOLDEN BLOOD: UNLOCKING THE POTENTIAL OF THE RAREST BLOOD TYPE

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Golden blood, known scientifically as Rh-null, is the rarest blood type in the world, considered by the complete absence of all Rh antigens on red blood cells. First uncovered in 1961 in an Australian woman, rarer than 50 individuals are known to have this blood type worldwide. Its widespread compatibility for Rh systems makes it a highly appreciated resource for transfusions, but its extreme rarity presents noteworthy challenges. Only nine active Rh-null donors universal form a critical network to supply this valuable blood for those in need. The identification of Rh-null blood necessitates focused testing beyond standard ABO and Rh typing, utilizing unconventional techniques like flow cytometry or molecular analysis to confirm the absence of Rh proteins. Blood typing mostly categorizes individuals as A, B, O, or AB, further confidential by the presence or absence of the Rh-D antigen. The scarcity of Rh-null donations adds insistence to preserving contact with the limited donor network to ensure accessibility for life-saving treatments. Known as "golden blood" due to its rarity and life-saving potential, this blood type highlights the standing of global cooperation in dealing rare resources within transfusion medicine.

Keywords: Golden blood, blood grouping, blood types, Rh-null, Antigens.

HEALTHMEDICON/25/PP-049

MELIOIDOSIS: THE SILENT THREAT OF COMMUNITY-ACQUIRED SEPTICAEMIA

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Melioidosis, caused by the Gram-negative bacterium *Burkholderia pseudomallei*, is a thoughtful infectious disease widespread in Southeast Asia, northern Australia, and parts of India. It principally affects entities during the rainy season, with diabetes mellitus being the most common risk factor. The disease demonstrates in various clinical forms, fluctuating from localized abscesses and pneumonia to rapidly lethal septicaemia. In endemic regions, case fatality rates (CFR) range from 16% to 50%. India has a high disease burden, with an estimated 20,000 to 52,000 new cases annually and 32,000 deaths. The first aboriginal case in India was reported in 1991, and improved diagnostic facilities have since led to increased gratitude along coastal states such as Karnataka, Kerala, and Tamil Nadu. Melioidosis presents acutely in over 85% of cases, with symptoms including fever, pneumonia, abscesses in several organs, septic arthritis, and osteomyelitis. Diagnosis entails clinical criteria (fever with sepsis, pneumonia, or deep-seated abscesses) mutual with epidemiological exposure to endemic areas or contaminated soil and water. Laboratory confirmation contains culture or PCR from blood, pus, sputum, cerebrospinal fluid, or urine. Due to its noteworthy health impact and potential as a bioterrorism agent, heightened awareness and diagnostic attentiveness are critical for timely treatment and supervision.

Keywords: *Burkholderia pseudomallei*, Rainy season prevalence, Case fatality rate (CFR), Pneumonia, Septicaemia, Southeast Asia, Culture and PCR testing

HEALTHMEDICON/25/PP-050

PHYTOCHEMICAL PRESERVATION IN APPLE PEEL POWDER: ENHANCING ANTIOXIDANT POTENTIAL AND ANTICANCER PROPERTIES

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Chronic diseases like cancer and cardiovascular disease have been associated with oxidative stress. Apple peels, rich in phenolic compounds, may help foil these conditions. In New York State, large quantities of apple peel waste are produced from applesauce and preserved apple production. This study explored processing methods to make a nutritious apple peel powder while preserving phytochemicals. Rome Beauty apple peels were preserved with citric acid, ascorbic acid, or blanching before oven-drying at 60°C. Blanching for 10 seconds retained the most phenolic content. Peels were then dried using different methods: oven-drying (40, 60, 80°C), air-drying, and freeze-drying. Air-dried and freeze-dried peels had the highest levels of phenolics, flavonoids, and anthocyanins, analogous to fresh peels on a fresh-weight basis. Freeze-drying resulted in lower water activity than air-drying. Scaling up the process using bleaching and freeze-drying produced a powder with 3342 mg/100 g total phenolics, 2299 mg/100 g flavonoids, and 169.7 mg/100 g anthocyanins. Its antioxidant activity was 1251 µmol

vitamin C equivalents/g, with one gram providing antioxidant power equivalent to 220 mg of vitamin C. The powder showed strong antiproliferative effects on HepG2 liver cancer cells ($EC_{50} = 1.88$ mg/mL). Apple peel powder could boost food products by accumulation health-promoting phytochemicals.

Keywords: Chronic diseases, Oxidative stress, Phytochemicals, Flavonoids, Anthocyanins, HepG2 liver cancer cells, Antiproliferative effects, Antioxidants.

HEALTHMEDICON/25/PP-051

NANOBOTS AS A FUTURE OF CANCER TREATMENT

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Nanorobotics is a growing field of nanotechnology that focuses on designing and building devices at atomic, molecule, or cellular levels. These hypothetical nanorobots, which are extremely small and can transverse into the human blood, can be programmed to diagnose and treat fatal diseases. One fascinating area of research is the application of nanorobots in cancer treatment. The World Health Organisation reported 8.2 million cancer deaths in 2012 and 11,48,692 cases in India in 2015. Nanorobots, which are 100 times smaller than human tissues, could potentially treat cancer cells, creating a significant area for biomedical research. As cancer is predicted to become a chronic but manageable disease, nanorobots could revolutionize cancer treatment. Early detection and diagnosis of cancers are challenging, leading to high mortality rates. Nanobots, a promising application of nanomedicines, are at the forefront of multidisciplinary research. Nanobots enable the assembly and deployment of functional molecules, increasingly being used in cancer diagnosis and treatment. Recent advancements in nanobots have transitioned from theory to practice, from in vitro experiments to in vivo applications. They are used in drug delivery, tumor sensing, targeted therapy, minimally invasive surgery, and other comprehensive treatments. Future medical nanobots are expected to become more sophisticated, performing multiple medical functions, becoming nanosubmarines in the bloodstream.

Keywords: Bloodstream, Cancer, Experiments, Nanorobotics, Nanotechnology

HEALTHMEDICON/25/PP-052

VIRUSES UNDER SURVEILLANCE

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An epidemic is a large, contained outbreak of a disease, while a pandemic is an international outbreak that is out of control. A Pandemic declaration indicates widespread transmission of a disease across multiple countries. Some government or agencies designate “red zones” to describe areas with severe outbreaks, requiring lockdown, quarantine or travel restriction. The main intention to choose that type of topic is to know about the outbreak of viruses which are under surveillance. The World Health Organization (WHO) and other health authorities

continuously monitor viruses with pandemic potential. This review aims to summarize the current status of viruses under surveillance, highlighting their epidemiology, transmission dynamics and public health implications. Our review identified several viruses under surveillance including: COVID 19, Mpox, Dengue, Seasonal Influenza, Avian Influenza, HMPV. These viruses categorized as “priority pathogens”, include those with epidemic and pandemic potential. Effective viral surveillance is crucial for protecting public health and mitigating the impact of viral diseases. At last we can conclude that Global surveillance of viruses is essential for preventing and responding to infectious disease outbreaks. Continued investment in surveillance infrastructure, research and international collaboration is necessary to stay ahead of emerging viral threats.

Keywords: Public Health, Epidemic, M-pox, HMPV, COVID 19, Out breaks

HEALTHMEDICON/25/PP-053

THE UNTAPPED POTENTIAL OF JACKFRUIT SEEDS: APPLICATIONS IN NUTRACEUTICALS AND FOOD PRODUCTS

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Jackfruit (*Artocarpus heterophyllus*) is a popular fruit in many Asian countries, but its seeds are often underutilized disdain their substantial nutritional benefits. Jackfruit seeds are rich in protein, fiber, and essential micronutrients, making them a potential functional food ingredient. Even though numerous studies have examined the composition and health benefits of jackfruit seeds, there is limited study of their saleable production and integration into food products. The inclusion of jackfruit seed flour in various food items increases their nutraceutical value and improves consumer acceptance. This review highlights the health-promoting properties of jackfruit seeds, concentrating on their application in food products. It also converses the valorisation of jackfruit seeds, accenting their potential in creating value-added products, and how these seeds impression the sensory, nutritional, and functional belongings of the final products. By incorporating jackfruit seeds into food formulations, it is possible to increase the nutritional content and offer health reimbursements, contributing to supportable food development. Overall, jackfruit seeds represent an unexploited resource with a great probability for food manufacturing, offering both nutritional and economic value.

Keywords: Micronutrients, Nutraceutical value, Sustainable food development, Economic value, Health-promoting properties.

HEALTHMEDICON/25/PP-054

COVID-19 VS. HMPV: A COMPARATIVE ANALYSIS OF GLOBAL IMPACTS AND PUBLIC HEALTH Strategies

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COVID-19, caused by the SARS-CoV-2 virus, was first identified in China in December 2019 and quickly escalated into a global pandemic. Human Metapneumovirus (HMPV), discovered in 2001, is another significant respiratory virus, primarily affecting the lungs. While both viruses share similarities, they have distinct differences in their characteristics and impacts. COVID-19 spreads through respiratory droplets and direct contact with infected individuals, causing symptoms ranging from mild respiratory distress to severe complications like blood clots and long-term health effects. HMPV is transmitted similarly but usually results in milder symptoms, posing serious risks to children, older adults, and immunocompromised individuals. COVID-19 has multiple vaccines and treatments, including antivirals and supportive care like oxygen therapy. In contrast, there are no vaccines for HMPV; prevention depends on measures like mask-wearing, hand hygiene, and avoiding close contact with infected individuals. Notably, countries with higher Human Development Index (HDI) report higher cases and deaths per million for both viruses, highlighting the importance of context-specific public health strategies. A healthier society requires robust emergency management, improved healthcare systems, and global collaboration to combat such respiratory illnesses effectively.

Keywords: COVID-19, Human Metapneumovirus (HMPV), Respiratory Viruses, Public Health Strategies, Prevention and Vaccination

HEALTHMEDICON/25/PP-055

METHODS FOR IDENTIFYING AND PREVENTING ADULTERATION IN HERBAL SUPPLEMENTS

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The rising mandate for herbal supplements has led to enflamed adulteration and conciliatory consumer safety and trust. Adulteration may result from intentional substitution, contamination, or mislabelling, highlighting the need for robust quality control procedures to ensure product legitimacy and safety. This review highlights key methods for recognizing and avoiding adulteration in herbal supplements. Botanical identification techniques include macroscopic and microscopic examination, DNA barcoding, and phytochemical analysis to validate plant materials. Chromatographic methods, such as high-performance liquid chromatography (HPLC), gas chromatography (GC), and thin-layer chromatography (TLC), are indispensable for detecting impurities and adulterants. Spectroscopic approaches, including infrared (IR) and nuclear magnetic resonance (NMR) spectroscopy, provide chemical fingerprinting for product confirmation. Stable isotope analysis is valued for verifying geographic origin and recognizing potential adulteration. Furthermore, adherence to Good

Manufacturing Practices (GMPs) helps maintain quality control throughout the supply chain. By participating in these methodologies, manufacturers, and controllers can enhance the veracity and safety of herbal supplements, fostering consumer sureness and mitigating health risks related to adulterated products.

Keywords: herbal supplements, adulteration, quality control, botanical identification, chromatography, HPLC, TLC, spectroscopy.

HEALTHMEDICON/25/PP-056

UNLOCKING THE POWER OF PINEAPPLE PEEL: A NATURAL REMEDY FOR HEALTH AND WELLNESS

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Pineapple peel is one of the best sources of vitamin C, flavonoids, bromelain, and other bioactive compounds, which have many potential health benefits. Some of the health benefits include anti-inflammatory effects, much of which is attributed to bromelain. It is claimed to help with gout, arthritis, and postoperative pain. Once it targets lung, colon, and breast cancer cells, the bioactive chemicals found in pineapple peel are considered to have anti-cancer potential as well. Pineapple peel is applied in the gastrointestinal tract, hence feeding the gut flora and encouraging the bowel to move on, as well as reducing the symptoms of irritable bowel syndrome (IBS) with respect to digestive health. Additionally, elevated blood pressure can be lowered and lipid profiles improved by the extract of pineapple peel, leading to better cardiovascular health. Healing comes about due to enhanced tissue strength and the formation of collagen. Moreover, the pineapple peel extract has anti-inflammatory and antibacterial properties and helps in treating dermatitis, acne, and eczema, and promoting healthy hair growth. Furthermore, pineapple peel consumption enhances the overall health of people, strengthens their immune system, and alleviates gastrointestinal complaints like GERD and ulcerative colitis. Additional benefits include improved fertility, better vision, protection from blue light, brain health, better lung function, and hormonal balance.

Keywords: Pineapple peel, Bromelain, Anti-inflammatory, Digestive health, Cardiovascular benefits

HEALTHMEDICON/25/PP-057

REPLACING DAMAGED DOPAMINERGIC NEURONS USING GENE THERAPY IN PARKINSON'S Disease

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Parkinson's disease (PD) is a neurodegenerative disorder involving progressive dopaminergic neuron loss in the substantia nigra, manifesting clinically as a movement disorder including tremors, rigidity, and bradykinesia. Gene therapy is a promising approach to replace damaged dopaminergic neurons and restore dopamine production in PD. Gene Therapy Strategies are Viral vector-mediated gene transfer: Gene transfer using viral vectors, such as adeno-associated

virus (AAV) or lentivirus, to deliver genes that promote dopamine production or neuronal survival, Stem cell-based gene therapy: Use of stem cells to generate dopaminergic neurons that can replace damaged cells in the brain and RNA-based gene therapy: Use of RNA molecules, such as small interfering RNA (siRNA) or antisense oligonucleotides, to modulate gene expression and promote dopamine production .Targets for Gene Therapy are Tyrosine hydroxylase (TH): Rate-limiting enzyme for dopamine synthesis and can be targeted to increase synthesis, Dopamine transporter (DAT): Protein that controls dopamine reuptake and, therefore, a target to enhance dopamine availability and Neurturin (NTN): A survival and differentiation-promoting protein for dopaminergic neurons.

Keywords: Neurodegenerative, Dopaminergic, *Substantia Nigra*, Oligonucleotides, Gene Therapy

HEALTHMEDICON/25/PP-058

COMPREHENSIVE REVIEW OF PEPTIC ULCER DISEASE MEDICATIONS: ESTABLISHED THERAPIES AND EMERGING DRUGS

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A peptic ulcer is a lesion in the mucosal lining of the digestive tract, typically resulting from the corrosive effects of gastric acid or pepsin in the stomach or duodenum. Patients with stomach ulcers suffer epigastric discomfort 15-30 minutes postprandially; conversely, in duodenal ulcers, the pain commences 2-3 hours after consumption. The condition is likely attributable to an imbalance between aggressive factors (pepsin and *H. pylori*) and defensive factors (gastric mucus, bicarbonate secretion, prostaglandins, and nitric oxide). However, *Helicobacter pylori*-related peptic ulcer disease and NSAID-induced peptic ulcer disease constitute the predominant cases. Epidemiologic Peptic Ulcer Disease (PUD) is a worldwide issue, with a lifetime probability of occurrence between 5% and 10%. In summary, efficient treatment, enhanced hygiene and sanitation conditions, and prudent use of NSAIDs have resulted in a reduction in the incidence of PUD globally. The typical symptoms of PUD encompass epigastric stomach pain, nausea, fluctuations in weight, hematemesis, among others. The management of peptic ulcers encompasses pharmacological interventions, dietary modifications, and, in some cases, surgical procedures. The objective is to diminish gastric acid and fortify the gastric mucosa. The therapies mostly include antacids, H₂ blockers such as cimetidine and ranitidine, proton pump inhibitors like omeprazole, antibiotics including amoxicillin and metronidazole, and anticholinergic agents such as pirenzepine and oxyphenonium. Stem Cell Therapy is a recently developed treatment for it. Recently identified pharmaceuticals include Vonoprazan, Tegoprazan, Polaprezinc, and Nocloprost.

Keywords: Peptic Ulcer, Hematostasis, Omeprazole, Vonoprazan, *H. pylori*

HEALTHMEDICON/25/PP-059

IMPACT OF HEALTH ECONOMICS OUTCOME RESEARCH (HEOR) ON THE PHARMACEUTICAL INDUSTRY

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Health Economics and Outcomes Research (HEOR) is a critical discipline in the pharmaceutical industry that evaluates the economic impact and overall value of medical treatments and interventions. By applying economic analysis, HEOR focuses on assessing the cost-effectiveness, cost-utility, and cost-benefit of pharmaceutical products, considering both direct and indirect costs associated with healthcare delivery. This research goes beyond clinical efficacy to understand the broader impact of treatments on patient outcomes, quality of life, and healthcare systems. HEOR is essential for several reasons. It helps pharmaceutical companies demonstrate the value of their products to regulatory bodies, payers, and healthcare providers. By presenting evidence on the cost-effectiveness of a drug, HEOR informs decisions regarding reimbursement, market access, and formulary inclusion. Furthermore, it plays a pivotal role in guiding product pricing strategies and optimizing resource allocation within healthcare systems. The growing demand for evidence-based healthcare decisions further underscores the importance of HEOR in bridging the gap between clinical trials and real-world evidence.

Keywords: Intervention, Healthcare Delivery, Clinical Efficacy, Reimbursement, Pivotal Role

HEALTHMEDICON/25/PP-060

EVOLUTION OF 3D PRINTED DRUG DELIVERY SYSTEM

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Since its introduction in the 1980s, 3D printing has transformed a number of scientific domains, including the pharmaceutical sector. The primary objective is to produce intricate, customized goods on demand using an affordable manufacturing approach. Over the past few decades, many research groups have become interested in using 3D printing to manufacture various medication delivery methods. The quantity of publications has increased since the first 3D-printed pharmaceutical product was approved in 2015. Our review's main goal was to provide an overview of how medication delivery systems have changed over the past 20 years, particularly the last five. The drug delivery methods are further divided into implants, transdermal delivery systems, microneedles, vaginal drug delivery systems, tablets, capsules, or dispersible films, and micro-anddose forms at the micro and nanoscales. Researchers may find it easier to review the publications and identify new research directions with the help of our classification.

Keywords: 3D printing, drug delivery systems, tablet, implant, TTS, microneedle

HEALTHMEDICON/25/PP-061

BANANA PEEL AS A FUNCTIONAL FOOD: NUTRITIONAL BENEFITS AND DISEASE RECOVERY POTENTIAL

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Due to the rich nutritional composition and bioactive compounds, the banana peel often discarded as an agricultural waste product—is also a functional food ingredient with considerable potential. In this paper, the phenolic content of banana peels, which comprise flavonols, hydroxycinnamic acids, flavan-3-ols, and catecholamines, along with its nutritional quality, bioactive compound, and health benefits, has been reviewed. These are compounds that have antibacterial, anti-inflammatory, and antioxidant properties. They therefore support several health benefits. The inclusion of banana peel in food products improves their nutritional content, especially through an increase in phenolic chemicals and dietary fibre. Studies have shown that the extraction from banana peels can extend the shelf life and quality of meat-based products by reducing lipid oxidation. Banana peel, because of its high fibre content and anti-inflammatory properties, has a promising potential to reduce the symptoms of gastrointestinal illnesses like ulcerative colitis and irritable bowel syndrome (IBS) in terms of disease recovery. Its antioxidant qualities may also help in reducing oxidative stress, which is linked to long-term diseases such as diabetes and cardiovascular disease. Though with several health advantages, banana peels contain various anti-nutritional elements in the form of oxalates, and tannins, which has to be removed for safe intake. On consideration of all those factors, the overall scenario of banana peels has been utilized for nutraceutical and functional foods but ensuring safety by government regulation and controlling quality.

Keywords: Banana Peel, Bioactive Compounds, Functional Foods, Antioxidant Properties, Gastrointestinal Health

HEALTHMEDICON/25/PP-062

MARINE-DERIVED BIOACTIVE METABOLITES: A NOVEL FRONTIER IN CARDIOVASCULAR DISEASE MANAGEMENT

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Marine-derived bioactive metabolites characterize an auspicious frontier in cardiovascular disease (CVD) management due to their unique structural variety and potent biological activities. CVD remains a leading cause of transience globally, demanding innovative therapeutic strategies beyond conformist approaches. Marine organisms, including fish, algae, and microalgae, produce metabolites with cardioprotective belongings, such as omega-3 polyunsaturated fatty acids, marine peptides, carotenoids, and sulfated polysaccharides. These compounds show anti-inflammatory, antioxidant, antihypertensive, antithrombotic, and lipid-lowering effects, contributing to cardiovascular health. Omega-3 fatty acids, found abundantly in fish oil, are predominantly noted for reducing triglyceride levels, refining endothelial

function, and moderating heart rate. Marine peptides and other bioactive demonstrate significant potential in inhibiting enzymes like angiotensin-converting enzyme (ACE), which regulates blood pressure. Moreover, marine-derived antioxidants can mitigate oxidative stress, a critical factor in atherosclerosis progression. The study of marine resources has expanded with advancements in biotechnology, allowing the sustainable extraction and synthesis of bioactive metabolites. While these compounds offer noteworthy therapeutic potential, clinical trials and complete evaluations are crucial to ensure effectiveness and safety. Integrating marine bioactive into nutraceuticals and pharmaceuticals could redefine CVD management, accentuating preventive and therapeutic benefits. This emerging field underlines the vast unexploited potential of marine biodiversity as a sustainable source of novel bioactive agents for cardiovascular health.

Keywords: Cardiovascular disease, angiotensin-converting enzyme, Atherosclerosis, Omega-3, marine peptides, antioxidants.

HEALTHMEDICON/25/PP-063

THE TRUTH ABOUT SUGAR: ENERGY SOURCE OR CANCER CULPRIT?

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The point here is that sugar provides energy for all cells, cancer cells included. Thus, it cannot be the cause of cancer because cancer cells, after all, consume an awful lot of glucose to keep their metabolism at its maximal pace. Although glucose is essential for the energy of both healthy and malignant cells, removing sugar from the diet does not stop cancer from spreading. The indirect connection between sugar and cancer is the real cause for concern. Long-term overindulgence in sugary foods causes weight gain, and obesity is a major risk factor for 13 distinct cancer types. Actually, after smoking, obesity is the second most prevalent cause of cancer. Natural sugars, found in fruits and whole grains, are better choices because they give you energy and other vital nutrients. Although they appear to be healthier, natural sweeteners, such as honey or agave, provide a very small extra health benefit. Two crucial strategies to reduce the risk of cancer include sugar intake regulation and maintaining a healthy weight. This can put into proper perspective the eating of a good diet rather than cursing specific ingredients in the food, such as sugar.

Keywords: Sugar, Cancer, Obesity, Glucose, Healthy Diet

HEALTHMEDICON/25/PP-064

THERANOSTIC APPLICATION OF NANOROBOTIC ARTIFICIAL BLOOD COMPONENTS: A COMPREHENSIVE REVIEW

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Nanotechnology has revolutionized the medical field bridging gap between engineering and medicine, offering a single platform for diagnosis, treatment and disease management. Among these nanorobots came a promising theranostic tool. Hematology lacked in development of bio-compatible blood components. Cutting edge advancements in nanorobotics helped to overcome these constraints of conventional pharmacological therapies by invention of nanorobotic artificial blood components which garnered significant attention due to their potential to mimic and enhance function of biological blood components mainly three such prototypes which are respirocytes, microbivores and clottocytes. Respirocytes or artificial red blood cells are hypothetical nanorobots designed to carry oxygen and carbon-dioxide removal whose capacity is estimated to be 236 times more potent than natural erythrocytes. Microbivores are artificial white blood cells which act as the first line of defence against pathogens and also help to combat anti-microbial resistance. Clottocytes are artificial platelets enabling rapid clot formation during surgical interventions or trauma care. These nanorobotic components hold potential in curing several respiratory and cardiovascular diseases, anaemia, hypoxia also can be used as a diagnostic tool in monitoring blood gas levels. Nanorobots can bring about transformation in healthcare with the development of minimally invasive, efficient and personalized medicines. This comprehensive review focuses on their working, development and clinical manifestations. However more rigorous research is needed on their biocompatibility, immunogenecity, safety and scalability to improve patient outcomes.

Keywords: Theranostic, Nanorobots, Respirocytes, Microbivores, Clottocytes.

HEALTHMEDICON/25/PP-065

SMART POLYMERS: AN INNOVATIVE APPROACH TOWARDS RNA BASED DRUG DELIVERY SYSTEM; CHALLENGES AND FUTURE PROSPECTS

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RNA based drug delivery system are innovative platforms designed to transport various RNA therapeutics such as mRNA, siRNA etc to target cells effectively. These systems use the unique properties of RNA molecules such as gene modulation and their ability to target the “undruggable” proteins. The delivery mechanisms of RNA based drug delivery systems include polymer-based systems, lipid-based systems and active targeting. This project aims at focusing on the Polymer-based systems, specifically “smart polymers” as these allow for fine tuning of chemical properties to protect RNA and improve pharmacokinetics. Smart polymers, also known as stimulus-responsive polymers, are advanced materials that undergo significant changes in their physical or chemical properties in response to external stimuli such as temperature, pH or light. Due to this they are extensively used in controlled drug delivery, tissue engineering and regenerative medicine. They are appearing as a promising platform for

the delivery of antiviral RNA drugs. Specifically, the rite of endosomal escape that enhances cellular entry and the use of targeting peptides which can improve specificity of RNA delivery to infected cells. Smart polymer-based RNA drug delivery system offers significant advantages over traditional polymer-based systems primarily due to their responsiveness to environmental stimuli, their reduced immunogenicity, tailored drug delivery and broad range of therapeutics. These are an innovative approach and offer promising solutions for targeted drug delivery, yet it is still in its infancy and efficient loading and targeted delivery for optimal therapeutic efficacy are still to be explored thoroughly.

Keywords - Drug delivery system, RNA, Synthetic polymers, Smart polymers, controlled drugs delivery.

HEALTHMEDICON/25/PP-066

HUMAN METAPNEUMOVIRUS: REVIEW OF AN IMPORTANT RESPIRATORY PATHOGEN

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Human metapneumovirus (hMPV), identified in 2001, is the most prevalent cause of upper and lower respiratory tract infections in young infants, although it can also affect the elderly and immune-compromised individuals. hMPV is the leading cause of hospitalization for children with acute respiratory tract infections, accounting for 5% to 10% of all admissions. hMPV infection can cause severe bronchiolitis and pneumonia in children, and the symptoms are similar to those produced by the human respiratory syncytial virus. The first infection with hMPV often occurs in early childhood, although re-infections are prevalent throughout life. Because the virus grows slowly in cell culture, molecular techniques (such as reverse transcriptase PCR) are the primary diagnostic modality for identifying hMPV. A few vaccine candidates have been demonstrated to be beneficial in preventing clinical illness, but none are now commercially accessible. Our understanding of hMPV has evolved significantly in recent years, and in this article, we will cover the most recent research on the molecular biology and epidemiology of hMPV. We will also discuss the existing treatment therapies and tactics utilized to reduce hMPV infection, with a focus on potential approaches for developing an effective hMPV vaccine.

Keywords: Human metapneumovirus, bronchiolitis, pneumonia, hMPV infection, human respiratory syncytial virus

HEALTHMEDICON/25/PP-067

THE FUTURE OF VACCINATION AND MEDICATION DELIVERY: NEEDLE FREE SOLUTION

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The technology known as needle-free injection (NFI) essentially eliminates the need for needles by using a variety of drug delivery methods that push medications through the skin using forces like Lorentz, shock waves, gas pressure, or electrophoresis. The developing world also benefits from this technology, which is very helpful in mass vaccination campaigns. It helps eradicate needle phobia and reduces the risk of needle stick injuries and other complications, such as those caused by using a single needle repeatedly. Based on their mode of operation, load type, drug delivery method, and delivery site, the NFI can be categorized. The NFI technology can provide a reliable, secure, and efficient mode of drug delivery. The technology's value is further increased by technically advanced needle-free injection systems' ability to administer highly viscous medication formulations that conventional needle and syringe systems cannot. Although there are other techniques to make NFI, the injection molding technique is the most commonly used method. Needle-free technology comprises three types: powder injections, liquid injections,depot or projectile injections. Numerous variations of this technology, including Bioject®, ZetaJet™, Vitajet 3, Tev-Tropin®, and others, are currently on the market. More money has been spent on the development of this technology, and a number of gadgets are currently on the market for a large global market.

Keywords: Needle free injection, Mass immunization , Lorentz , Needle stick injuries.

HEALTHMEDICON/25/PP-068

SMART HYDROGELS IN TISSUE ENGINEERING AND REGENERATIVE MEDICINE

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Advances in bioengineering over the past few decades have sparked interest in the field of regenerative medicine, which holds great promise for better treatment outcomes. Tissue engineering techniques and the construction of functional structures that can replace, preserve, and regenerate missing tissues and organs have had an impact on all areas of medicine and healthcare. Strategies that integrate biomimetic materials, cells, and bioactive chemicals are essential for accelerating tissue regeneration or serving as therapeutic systems. Throughout the past twenty years, Hydrogels have been one of the most popular scaffolds for tissue engineering because of their capacity to replicate the natural extracellular matrix, preserve a distinct three-dimensional structure, and give the cells in the produced tissues mechanical support. The high-water content of hydrogels can create the perfect conditions for cell viability and an environment that resembles natural tissues. Hydrogel Systems have been used as a supporting

matrix for the delivery of growth factors and cell immobilisation. The features, structure, synthesis and fabrication techniques, uses, and future prospects of smart hydrogels in tissue engineering are briefly described in this review.

Keywords: Regenerative Medicine; Hydrogels; Tissue Engineering; Smart Hydrogels.

HEALTHMEDICON/25/PP-069

A REVIEW ON THE ROLE OF HERBAL COSMECEUTICALS IN ALOPECIA

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Alopecia refers to hair loss or baldness. Alopecia can be classified as Alopecia Areata, Androgenetic Alopecia, Alopecia Totalis, Alopecia Universalis, Telogen Effluvium etc. On a daily basis, the hair falls count specifically throughout washing and brushing. It's normal to shed between 50 to 100 hairs a day, this is a part of natural hair cycle. However, hair fall over 125 hairs a day lasting longer than a couple of weeks indicates a serious problem, that termed as alopecia. There are several factors that cause hair loss including genetics, nutritional deficiencies, stress, medications & supplements, chemotherapy. Certain cosmeceuticals can be used to potentially support hair growth, reduce hair loss and improve alopecia. Key ingredients commonly found in cosmeceuticals, such as minoxidil, certain vitamins, peptides, corticosteroids, ketokonazole, finasteride that improve hair regrowth, reduce hair shedding. But these medications have several side effects including dermatitis, inflammation, itching, erythema etc. Herbal cosmetics are increasingly in demand in a global market and represent a valuable contribution from nature. About 85% of physicians recommend the use of herbal medicine. By using herbal cosmeceuticals, the best and safest alternative treatment of alopecia can be provided. Several herbs have traditionally been used to support hair health and combat alopecia but may not be widely available in mainstream markets. *Aloe Barbadensis* (Aloe Vera), *Phyllanthus Embilica* (Amla), *Allium Sepa* (Onion), *Allium Sativum* (Garlic), *Eclipta Alba* (Bhringraj), *Thea Sinesis* (Tea), *Trigonella Foenum graecum* (Fenugreek), *Cocos nucifera* L. (Coconut), *Prunus amygdalus* (Almond), *Oscimum sanctum* (Tulsi) are the few examples of herbal cosmeceutical used to treat alopecia.

Keywords: Alopecia areata, Falling of hair, Herbal cosmetics, Amla, Bhringraj.

HEALTHMEDICON/25/PP-070

THE ROLE OF INDIAN HERBS AND SPICES IN TRADITIONAL MEDICINE: ETHNOPHARMACOLOGICAL INSIGHT

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Indian herbs and spices have traditionally been esteemed for their therapeutic and medicinal attributes, constituting a fundamental component of ancient medical systems like Ayurveda, Siddha, and Unani. This review explores the ethnopharmacological importance of frequently utilized Indian herbs and spices, highlighting their function in disease prevention and

management. Ingredients such as turmeric (*Curcuma longa*), ginger (*Zingiber officinale*), cinnamon (*Cinnamomum verum*), basil (*Ocimum sanctum*), black pepper (*Piper nigrum*), cardamom (*Elettaria cardamomum*), cloves (*Syzygium aromaticum*), nutmeg (*Myristica fragrans*), saffron (*Crocus sativus*), fenugreek (*Trigonella foenum-graecum*), cumin (*Cuminum cyminum*), mustard (*Brassica nigra*), coriander (*Coriandrum sativum*), and fennel (*Foeniculum vulgare*). include bioactive components that have established antioxidant, anti-inflammatory, antibacterial, and immunomodulatory activities. The medicinal potential of these natural products is attributed to their phytochemical composition, encompassing alkaloids, flavonoids, terpenoids, and polyphenols. These substances not only promote overall health but also reduce the risk of chronic disorders, including diabetes, cardiovascular diseases, and cancer. Moreover, their cost-effectiveness, cultural acceptance, and limited adverse effects augment their efficacy as supplementary or alternative therapies. Advocating for the incorporation of Indian herbs and spices into conventional healthcare may facilitate the development of innovative medicinal agents and functional meals, safeguarding cultural heritage while tackling global health issues. The study emphasizes the necessity for rigorous research and standardization to fully utilize these bioresources for sustainable healthcare solutions.

Keywords: Indian herbs and spices, ethnopharmacology, traditional medicine, phytochemicals, disease management.

HEALTHMEDICON/25/PP-071

ORANGES: A COMPLETE GUIDE TO HEALTH AND NUTRITION

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Around the world, oranges (*Citrus sinensis* is a member of the Rutaceae family) are widely recognized for their nutritional and therapeutic qualities. The entire orange plant—including its ripe and unripe fruits, juice, peels, leaves, and flowers—has been utilized as a traditional medicine for age. The fruit is an indehiscent, fleshy berry that varies greatly in size, ranging from 4 to 12 cm. Oranges have some medical qualities like antibacterial, antifungal, antidiabetic, cardioprotective, anti-inflammatory, antioxidant, anti-tubercular and anti-hypertensive. Additionally, fresh citrus fruits are a good source of dietary fibre, which has been linked to decrease blood cholesterol. The fruits provide phytochemicals such carotenoids, flavonoids, and limonoids, as well as the most abundant nutrient, vitamin C, and B vitamins (thiamin, pyridoxine, niacin, riboflavin, pantothenic acid, and folate). Terpenoids, triterpenes, flavonoids, amino acids, phenolic acids, mineral components, and polysaccharides are just a few of the numerous other useful bioactive phytochemicals found in Oranges that are good for human health. These biological constituents are of vital importance in human health improvement due to their antioxidant properties, ability to be converted to vitamin A (for example, β -cryptoxanthin), and purported protection from various chronic diseases. Orange is well known for its medicinal and nutritional properties all over the world. Plant parts like peel, flower, fruit and juice are used as a traditional medicine. The available literature does not reveal any adverse or side effects. Clinical trials need to be carried out to exploit the therapeutic utility of orange in Combating various diseases.

Keywords: Orange, Anti-oxidant, Cardioprotective, Phytochemicals, Antihypertensive

HEALTHMEDICON/25/PP-072

MICROFLUIDIC CHIP TECHNOLOGY IN PHARMACEUTICAL ANALYSIS

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Microfluidic chip technology has gained significant attention in pharmaceutical analysis due to its ability to miniaturize and streamline complex processes, offering high precision and efficiency in drug development and testing. These chips integrate microchannels, sensors, and pumps to manipulate and analyse small volumes of fluids, enabling real-time monitoring of chemical reactions, biological assays, and pharmacokinetic studies. In pharmaceutical analysis, microfluidic chips facilitate rapid screening of drug candidates, optimize formulations, and enhance the study of drug interactions, stability, and bioavailability. The technology also supports personalized medicine by enabling point-of-care diagnostics and customized drug testing. Despite challenges such as material compatibility, fabrication costs, and integration with other analytical platforms, advancements in microfluidic chip technology promise to revolutionize pharmaceutical research by providing cost-effective, high-throughput, and precise tools for drug discovery, development, and testing.

Keywords: Microfluidic Chip, Integrated Microchannels, High-Throughput, Drug Discovery, Biological Assays

HEALTHMEDICON/25/PP-073

UNPEELING THE SECRETS: PHYTOCHEMICAL SCREENING OF SPIRAL FLAG

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Spiral flag, or *Costus igneus Nak* and *Costus pictus D. Don*, is a plant that is new to India and belongs to the Costaceae family. It is an upright, spreading perennial that grows to a height of two feet. Its leaves are arranged in a spiral pattern, and its flowers are visually appealing. It typically grows as an ornamental plant in southern India, and its leaves are used as a dietary supplement to treat diabetes mellitus. Proteins, alkaloids, carbohydrates, triterpenoids, tannins, saponins, flavonoids, steroids, and significant amounts of trace elements are also found, according to different phytochemical analyses. The extracts of rhizomes, leaves and stem was done via maceration where the solvent was a mixture of chloroform and water. We have extracted the stem, rhizomes, and leaves of Spiral Flag and conducted a number of phytochemical tests on them in order to identify its phytoconstituents and possibly investigate the potential medicinal uses of the stem, rhizomes and leaves of *Costus pictus D. Don*. Based on the above results it is evident that the leaves of *C. pictus* have more useful phytochemicals compared to its stem and rhizomes.

Keywords: Perennial, Ornamental, Phytochemical, Maceration, Diabetes mellitus.

HEALTHMEDICON/25/PP-074

PREBIOTICS AND PROBIOTICS: A NEW ERA OF TREATING LIFESTYLE DISORDER

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Nutraceuticals are foods or parts of foods that are intended to have health benefits beyond their nutritional value. The term is a combination of the words “nutrition” and “pharmaceutical”. Vitamins, minerals, herbal products, dietary fibres and many more can be considered as nutraceuticals and help in inflammation, mental health, cardiovascular health, cancer treatment, neurological condition, metabolic condition. Nowadays, consumers are willing to buy probiotic and prebiotics rich food and supplement, that constitute some of the functional food market, which is constantly expanding. Indeed, there are many products available that incorporate probiotics, such as yogurt, cheese, juices, jams, cookies, nutritional supplements, etc. Prebiotics are non-digestible fibres that come from plant foods and they help in sustaining the good gut bacteria and are often paired with probiotics which help promote the good bacteria within the human microbiome. Some good examples of prebiotic sources are asparagus, chicory root, onions, garlic, bananas, soybeans, Jerusalem artichokes, leeks, and dandelion greens. The benefits that prebiotics can provide is quite extensive and they include enhancing gut microorganisms as well as immune functionality and inflammation reduction; also of great utility, prebiotics can also help with metabolic regulation through blood sugar, cholesterol and triglyceride balances. Probiotics are live microorganisms that promote health by supporting digestion and immune function. Common types of probiotics include *Lactobacillus*, *bifidobacterium*, *Saccharomyces bouvardia*, and soil-based blends. They can help prevent antibiotic-related diarrhoea, treat infant colic, manage periodontal disease, and support ulcerative colitis remission. There are some of marketed neutraceuticals present which are used in daily basis are β-carotene soft gel capsules, Phytrol, Revital, Yakult etc. The neutraceuticals industry grew at an annual average growth rate of 7.3 %, whereas the growth rate of this industry over the past several years has doubled to 14.7 %.

Keywords: Nutraceuticals, Prebiotics, Probiotics, Gut health, Metabolic regulation

HEALTHMEDICON/25/PP-075

COMPARATIVE PHARMACOGNOSTIC AND PHYTOCHEMICAL SCREENING OF THE LEAVES, STEM AND FLOWER OF *CALOTROPIS GIGANTEA* AND *CALOTROPIS PROCERA*

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Herbal medicines have been used from the earliest times to the present day. *Calotropis gigantea* and *Calotropis procera* belong to the family of Apocynaceae, surrounded throughout India and in other tropical areas. Their common name is Akanda. In ancient Ayurvedic medicine the plant *Calotropis procera* was known as “Rakta arka”. The extracts from different parts of the plant

have significant therapeutic value. The whole plant when dried exhibits good tonic, antihelmintic and expectorant activities. The leaves are used to treat joint pain and reduce swelling in Ayurveda. *Calotropis procera* is also used as a homeopathic medicine. The current research work is based on its identification of crude plant drug for its uses in modern medical sciences. The present study involved the comparative morphological, microscopical, pharmacognostical and phytochemical evaluation of leaf, stem and flower of two species, *Calotropis gigantea* and *Calotropis procera*. Both species showed the presence of alkaloids, glycosides, flavonoids, steroids, and tannins including carbohydrates, proteins, and lipids. These findings suggest that *Calotropis gigantea* shares some similar macroscopical and phytochemical characteristics as that of *Calotropis procera* but is very similar in the types of alkaloids, steroids, and flavonoids. There are few differences with the pharmacognostical and phytochemical parameters which will help in differentiation and identification of species.

Keywords: Pharmacognostical, Phytochemical analysis, Apocynaceae, *C.gigantean*, *C.procera*

HEALTHMEDICON/25/PP-076

**COMPARATIVE ANALYSIS OF HPLC AND UHPLC IN
ANALYTICAL CHEMISTRY**

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HPLC and UHPLC are two primary methodologies in analytical chemistry, having their own distinctive advantages in regard to separation power, resolution, and speed in analysis. Here is a complete comparative study that provides an introduction to the general principles of these two techniques; major differences exist with their applications throughout different scientific branches. With a comparison of factors such as particle size, pressure, column length, and detection methods, we explain the strengths and limitations of each. HPLC is well known for separating compounds, identifying compounds, quantifying compounds, analysing samples, determining chemical composition, determining chemical purity etc. and UHPLC for quality control, environmental analysis, pharmaceutical analysis, peptide separation and polymer characterization. The analysis is meant to further highlight the effect of UHPLC, in terms of improved separations and higher resolution due to gains achieved from denser separation, as opposed to practical effects on laboratory workflows and cost viability. This comparative study highlights the advantages and limitations of each technique in key performance parameters, cost-effectiveness, sensitivity as well as separation efficiency will guide researchers in choosing the most suitable chromatography method for their specific analytical needs.

Keywords: High performance Liquid Chromatography, Ultra High performance Liquid Chromatography, Pharmaceutical analysis, Quality Control, Identifying compounds

HEALTHMEDICON/25/PP-077

EXPLORING THE THERAPEUTIC POTENTIAL OF THE INSULIN PLANT: A NATURAL REMEDY FOR DIABETES MANAGEMENT

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Costus igneus, commonly known as The "insulin plant" is an herb that is native to Southeast Asia. Currently grown in southern India. Plants have potential in diabetes management due to the presence of bioactive compounds such as steroids, alkaloids, flavonoids, triterpenes, glycosides, saponins etc. These compounds contain Helps in various pharmacological fields Including anti-inflammatory anti-spread, anti-bacterial, anti-urinary, *Costus igneus* leaves which have anti-diabetic effect. It is often used to manage blood sugar levels, making it a valuable supplement for diabetics. Research also shows that the ability to control insulin sensitivity and reduce high blood sugar levels may offer benefits as an alternative treatment. This review explores the various medicinal properties of *Costus igneus*, focusing on its antidiabetic potential and other therapeutic effects. It emphasizes the need for further research to fully understand its clinical applications. and increasing its role in modern health care.

Keywords: Igneous Rock, Insulin Plants, Diabetes, Phytochemicals, Anti-Diabetic Drugs, Anti-Inflammatory Drugs, Anti-Nerolithiasis.

HEALTHMEDICON/25/PP-078

A REVIEW ON THE CURRENT TREATMENT PROCEDURES FOR LEPROSY

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Leprosy is a chronic, infectious disease caused by *Mycobacterium leprae*. Peripheral nerve system, skin, reticulo-endothelial system, bones, joints, eyes, testicles, muscles, and adrenal glands are among the tissues that are typically affected. There are usually a few to many lesions present in clinical leprosy presentations. Macular and hypopigmented lesions are the most common presentation of early leprosy in patients. Leprosy treatment is free and accessible worldwide. Multi-Drug Therapy (MDT) is the term for the combination of three antibiotics used in the treatment. No other treatments will cure leprosy. The WHO recommended combination of rifampicin, dapsone, and clofazimine, known as multidrug therapy (MDT), has been shown to be highly effective in treating leprosy patients, with a very low risk of relapse. However, in an effort to reduce treatment duration, which varies from 6 to 24 months depending on the clinical forms of illness, as well as to guard against the possibility of developing resistance to existing drugs, alternative antibiotics and therapeutic approaches are being researched. Furthermore, because neurological complications are a major concern, leprosy reactions, which can happen during or after specific treatment, should be carefully monitored. It is critical to emphasise the significance of leprosy treatment early on. To prevent the almost inevitable progression towards neurological complications, it must be prescribed in the early,

strictly dermatological stages. This review aims to provide an overview of MDT done to cure leprosy in both adults and kids.

Keywords: Leprosy, Mycobacterium leprae, Multi-Drug Therapy (MDT), Leprosy treatment, Antibiotic resistance.

HEALTHMEDICON/25/PP-079

Potentials of *Passiflora incarnata* in Addressing Post-Traumatic Stress Disorder

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Post-Traumatic Stress Disorder (PTSD) is a significant mental health concern characterized by intrusive memories, hyperarousal, and avoidance behaviour following exposure to traumatic events. Conventional treatments have limitations, prompting interest in alternative approaches. *Passiflora incarnata*, Commonly Known as Passion flower, is an Herbal Remedy with anxiolytic and sedative properties. The fruit widely used in traditional medicine for anxiety-related conditions suggests its anxiolytic potential. It contains bioactive phytocompounds like flavonoids and alkaloids that interact with neurotransmitter systems, possibly influencing GABA receptors to induce relaxation. Although many research on its direct impact on PTSD is limited. Both preclinical and clinical studies have demonstrated the plant under study's effectiveness in reducing anxiety and its ability to modulate stress responses and improve sleep aligns with PTSD symptomatology was observed. However, controlled trials specifically targeting PTSD are necessary to validate for its efficacy. Factors like optimal dosing, safety, and potential interactions need exploration. It exerts as a promising natural remedy for alleviating PTSD symptoms due to its historical use and anxiolytic properties. Further research, particularly rigorous clinical trials, is needed to ascertain its effectiveness, safety, and appropriate role in PTSD treatment paradigms.

Keyword: Post Traumatic Stress Disorder (PTSD), Passion flower, Neurotransmitter, Anxiolytics, Flavonoids

HEALTHMEDICON/25/PP-080

THERAPEUTIC IMPORTANCE OF GOURD FAMILY: A MEDICINALLY IMPORTANT FAMILY

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Ayurveda, Unani, and Siddha are among the traditional healing methods that utilize the gourd family or the Cucurbitaceae family in their treatments. This family includes a number of edible vegetables and fruits that hold high nutritional values and medicinal characteristics that can be dated back to early civilization. Medical anthropology and traditional practice would attest cucumber-based medicine in treating a number of illnesses such as anemia, inflammation, tumors, indigestion and even poisoning. Parts of cucurbitaceous plants such as the leaves, stems, flowers, seeds, roots and fruits also cater bioactive compounds including glycosides,

saponins, terpenoids and even steroids. These phytochemicals are antiviral, anticancer and antimicrobial aiding in hypolipidemic, anti-diabetic and anti-inflammatory activities. Cucurbitaceae family has exceptional medicinal features that can be used for cooling, detoxification and digestion and can help balance body humor, get rid of toxins as well as chronic diseases in Unani. Such topics are also covered in Siddha performing rejuvenating techniques in order to handle chronic conditions Huai and insulin resistant diabetes. This article brings together both ancient knowledge and modern research illustrating the diversity of phytochemicals and health benefits found along with the use of the cucurbitaceae family in veterinary medicine. Integrating chemical Profiling with bioexploration can help promote the therapeutic properties of herbal and traditional medicines for humans' well-being by aiding in the preparation of new innovative functional foods.

Keywords: Therapeutic, Phytochemicals, Ethnopharmacology, Anti-Inflammatory.

HEALTHMEDICON/25/PP-081

REVOLUTIONIZING CYSTIC FIBROSIS TREATMENT: THE ALYFTREK DISCOVERY

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Cystic fibrosis (CF) is a genetic disorder caused by mutations in the cystic fibrosis transmembrane conductance regulator (CFTR) gene, leading to abnormal mucus production and respiratory complications. Recently, Alyftrek tablet has been discovered as a potential therapeutic agent for CF. This novel drug targets the underlying cause of CF by enhancing CFTR protein function and promoting normal mucus clearance. More than 1,000 patients across more than 20 countries and more than 200 sites Preclinical studies have demonstrated the efficacy of Alyftrek in improving lung function and reducing inflammation. The therapeutic effect of Alyftrek on the body is multifaceted. By restoring CFTR function, Alyftrek facilitates the clearance of thick, sticky mucus from the airways, reducing the risk of respiratory infections and improving overall lung health. The therapeutic effect of Alyftrek on the body is multifaceted. However, common side effects include headache, nausea, and diarrhea. Adverse effects, although rare, may include elevated liver enzymes and allergic reactions. Long-term use of Alyftrek may also lead to increased risk of respiratory infections.

Keywords: Cystic Fibrosis, ALYFTREK, CFTR Gene Mutation, FDA Approval, Clinical Trials, Adverse effect.

HEALTHMEDICON/25/PP-082

Global Health Security: Preparing for Future Threats

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Global health security is an issue of paramount importance in our increasingly interconnected world, where emerging diseases and health threats can quickly spread across borders. This

poster explores the concept of global health security and its importance in preparing for future health threats. Global health security protects populations from health threats that are beyond national boundaries, including infectious diseases, bioterrorism, and natural disasters. The Global Health Security Agenda is focused on the improvement of health systems around the world by strengthening capacities for disease surveillance, rapid response, and effective prevention strategies. Robust surveillance that can detect the outbreak early and comprehensive vaccination against the spread of diseases are included in the elements of global health security. Strong public health infrastructure and rapid response teams to contain a health crisis are needed, as well as collaboration among countries that ensures information and resources are exchanged. Case studies of recent pandemics, such as COVID-19, Ebola, and Zika virus, highlight the successes and challenges in responding to global health threats. Still, there are significant challenges, which include limited resources, political and social factors, and the constant need for new technology. Strengthening health systems, better global health governance, and creating public awareness and education are key areas of future direction in global health security. In conclusion, global health security is important for the protection of public health on a global scale. By investing in robust health systems and fostering international cooperation, we can better prepare for and respond to future health threats, ensuring a healthier and safer world for all.

Keywords: Global health security, Pandemics, Vaccination, Robust surveillance.

HEALTHMEDICON/25/PP-083

THE MIRACULOUS MORINGA: UNVEILING ITS THERAPEUTIC POTENTIAL

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Moringa (*Moringa oleifera* Lam.) is a type of local medicinal Indian herb belonging to the family of Moringaceae . The tree is often referred to as a “wonder-tree” for its multipurpose usability and also known as “Drumstick-tree”, “Horseradish-tree” and “Benoil tree. Moringa can be grown in the even the harshest and driest of soils, where scarcely anything else will grow. *M. oleifera* is considered as “miracle tree” due to its amazing healing abilities for various ailments and even some chronic diseases because all its parts are used, especially for their pharmacological and nutritional properties. *M. oleifera* is found in many tropical and subtropical. The extraction of leaves was done via maceration where the solvent was a mixture of chloroform and water. We have extracted the leaves of Moringa and conducted a number of phytochemical tests on them in order to identify its phytoconstituents and possibly investigate the potential medicinal uses of the leaves of *Moringa oleifera* Lam. The results suggest the presence of tannins, alkaloids steroids, triterpenoids, flavonoids, hydroxy-anthraquinones, cardiac glycosides, saponins, and carbohydrates (glucose and fructose). However, the tests for proteins and fixed oils and fats were negative. Based on the above results it is evident that the leaves of *Moringa oleifera* Lam have useful phytochemicals.

Keywords: Miracle tree, Medicinal herb, Phytochemicals, Pharmacological properties, Nutritional properties, Maceration, Chloroform extraction

HEALTHMEDICON/25/PP-084

MEDICINAL PLANTS USED FOR DIGESTIVE SYSTEM RELATED DISORDERS

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The most prevalent forms of diseases affecting a huge number of individual throughout the world are digestive system problem. Herbal medicine arguably the oldest form of health care known to humanity. According to the World Health Organization (WHO) , over 100 million people died globally as a result of digestive system diseases in 2012. Medicinal plants have been used by all cultures throughout history and still continue to be an integral part of our modern civilization. Some medicinal plants which are used for digestive system disorder are Chicory, Peppermint, Ginger, Cinnamon, Glycyrrhizaglabra, Aloevera, Carom seed, Cardamom, Senna, Coriander, Turmeric, Fennel. The goal of this review is to provide established and verified use of plant based medicine used in treatment of digestive problems.

Keywords: Digestive system problem, Herbal Medicine, Medicinal plants, Anti-inflammatory.

HEALTHMEDICON/25/PP-085

PHARMACOGNOSY AND COMPARATIVE EVALUATION OF DIFFERENT EXTRACTION METHODS FOR ITS YIELD, PHYTOCHEMICAL ANALYSIS FROM THE STEMS OF STAR FRUIT PLANT

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Star fruit (*Averrhoa carambola*) is a well-renowned fruit in the tropical and sub-tropical regions. *Averrhoa carambola* is a member of the Oxalidaceae family. To harvest its fruit, it is grown all over the world, but especially in South-East Asia. It has a number of therapeutic and nutritional applications. It has been used to treat several illnesses, such as diabetes, hypertension, urinary tract infections, and gastrointestinal problems. The quantity of natural antioxidants and phenolic compounds, including epicatechins, catechins, and gallic acid in gallotannin form, are thought to be responsible for *A. carambola*'s medicinal potential. Its therapeutic qualities and health advantages are attributed to these bioactive ingredients. However, case reports and case series in the literature describe the neurotoxicity and nephrotoxicity associated with eating star fruit. In this study, we have performed macroscopy, microscopy of the stems of starfruit to understand its anatomy. In addition to that, we have done the extraction of starfruit stem using different methods and compared their respective yields and phytochemical analysis of the stem and bark to identify the phytoconstituents and potentially study their therapeutic benefits. Microscopy of the stem and bark revealed the presence of cork, cortex, lignified xylem and phloem. Extraction gave us a comparative idea of the yields of the respective methods. Phytochemical screening of the stem and bark reveals the presence of reducing sugars, alkaloids, tannins and fats and oils.

Keywords: *Averrhoa Carambola*, Extraction, Phytochemical Analysis, Alkaloids.

HEALTHMEDICON/25/PP-086

IMPACT OF ARTIFICIAL INTELLIGENCE IN GLOBAL HEALTHCARE

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AI applications have altered healthcare. This study is based on a general literature analysis that reveals the significance of AI in healthcare and focusses on the following major aspects: (i) Medical imaging and diagnostics, (ii) Virtual Patient Care, (iii) Medical Research and Drug Discovery, (iv) Patient Engagement and Compliance, (v) Rehabilitation, and (vi) Other Administrative Applications. AI is used to detect clinical conditions in medical imaging and diagnostic services, control the outbreak of coronavirus disease 2019 (COVID-19) with early diagnosis, provide virtual patient care using AI-powered tools, manage electronic health records, augment patient engagement and compliance with the treatment plan, reduce the administrative workload of healthcare professionals (HCPs), discover new drugs and vaccines, spotting medical prescription errors, extensive data storage and analysis, and technology-assisted rehabilitation. Nonetheless, this science proposal addresses a number of technological, ethical, and social issues, including privacy, safety, the freedom to choose and experiment, prices, information and permission, access, and efficacy, while incorporating AI into healthcare. The governance of AI applications is critical for patient safety and accountability, as well as increasing HCPs' confidence in improving adoption and boosting substantial health outcomes. Effective governance is required to handle regulatory, ethical, and trust challenges while increasing AI adoption and deployment. Since COVID-19 struck the global health system, the notion of AI has sparked a revolution in healthcare, and such an uprising might be another step ahead in meeting future healthcare demands.

Keywords: Artificial Intelligence, Ethics, Governance, Healthcare, Patient Safety

HEALTHMEDICON/25/PP-087

CIRCADIAN RHYTHM AND PULSATILE DRUG SYSTEMS: REVOLUTIONIZING THERAPEUTIC PRECISION

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Human biological functions are dependent on the circadian rhythm regulated by light and dark. Chronobiology is the study of the biological functions regulated by circadian rhythm. A pulsatile drug delivery system is a time-controlled process where the drug is released after a predetermined time at a specific site. Drugs may cause toxicity if the level is constant, but rapid and transient release of a certain amount of drug is required within a short period is important. The formulations are designed in a way to achieve the C_{max} of the drug during the peak of the disease. Our blood pressure decreases during the sleep cycle and a sudden rise in the early morning increases the risk of heart attack. The drug release can be controlled by time, pH or external stimulation and their administration is coordinated with the circadian rhythm they

work better. Tablets are coated with natural gum of okra which allows the drug to release after a specific time period rapidly. The main goal is to deliver the optimal drug dose at site at the right time to control the disease as well as to avoid life-threatening conditions like MI, CHF, stroke etc. PDDS releases the drug by removing the plug when comes in contact with GI fluid or by rupturing the coating of the reservoir device.

Keywords: Circadian Rhythm, Pulsatile Drug Delivery System (PDDS), Chronobiology, Time-Controlled Release, Okra Gum Coating

HEALTHMEDICON/25/PP-088

ASWAGANDHA: A NATURAL SOLUTION FOR DIABETIC NERVE DAMAGE

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Diabetic neuropathy (DN) is a common complication of diabetes caused by long-term high blood sugar levels, leading to nerve damage. Current treatments mainly address symptoms, with few options for reversing the damage. Ashwagandha (*Withania somnifera*) of family Solanaceae, a traditional Ayurvedic herb, has gained interest for its potential to help manage DN. It has potent antioxidant and anti-inflammatory properties that may reduce oxidative stress, a key factor in nerve damage, and inflammation, which can worsen symptoms. Ashwagandha's adaptogenic properties may also help reduce stress, which can further aggravate DN. Preliminary studies suggest that ashwagandha might assist in regulating blood sugar levels, potentially preventing additional nerve damage. Although research on ashwagandha's direct impact on DN is limited, its effects on nerve health, blood sugar control, and stress reduction make it a promising addition to DN treatment. The herb contains compounds like withanolides and alkaloids, which have shown anti-diabetic and anti-inflammatory effects, potentially easing neuropathy symptoms. Further clinical studies are needed to confirm ashwagandha's efficacy and safety in treating DN. Patients should consult healthcare providers before using ashwagandha as part of their diabetes care plan.

Keywords: Ashwagandha, diabetic neuropathy, nerve damage, blood sugar regulation, inflammation.

HEALTHMEDICON/25/PP-089

ADHATODA VASICA LEAF EXTRACT: A RICH SOURCE OF PHYTOCHEMICALS WITH THERAPEUTIC POTENTIAL

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Adhatoda vasica often referred to as Vasaka, Baker, or Malabar Nut, it is a member of the Acanthaceae family. This evergreen shrub, which ranges in height from 1.0 to 2.5 meters, has an unpleasant odor and a harsh flavor. It is roughly one to two and a half meters tall. This plant's leaves and blooms are widely used as an expectorant, antispasmodic, cough, cold, and asthma remedy. A vasica leaf extract was recently tested pharmacologically for its ability to prevent diarrhea and dysentery because it contains chemical substances called flavonoids, alkaloids,

tannins, and saponins. The extract of the leaves was done by the process of maceration. We have extracted the leaves of Vasaka and performed transverse section microscopy to understand its anatomy and conducted a number of phytochemical tests on them in order to identify its phytoconstituents and possibly investigate the potential medicinal uses of the leaves. Alkaloids, steroids, flavonoids, terpenoids, tannin extract, saponins, and glycosides were among the various phytochemical substances that were examined. The extract had secondary metabolites, including alkaloids, flavonoids, tannins, and phenol, according to the phytochemical screening. Based on the above results it is evident that the leaves of *Adhatoda vasica* have useful phytochemicals which on further testing shows antimicrobial effects.

Keywords: *Adhatoda vasica*, leaf extract, phytochemicals, therapeutic potential, maceration

HEALTHMEDICON/25/PP-090

ROOTED IN RELIEF: PHYTOTHERAPY FOR CHRONIC PAIN

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The term "phytotherapy" refers to the use of herbs for medical purposes, which has been practiced since ancient times. Chronic pain, a severe ailment impacting millions globally, requires novel and lasting therapeutic interventions. After cancer-related illnesses and incapacitating heart disease, pain is regarded as the third most prevalent health issue. It is a painful process that culminates in inhibition, perception, and stimulation. Even while pharmacological painkillers can significantly reduce pain in a variety of pain-related conditions, many patients seek support from complementary and alternative medicine due to the severe side effects caused by analgesics. This present study explores the therapeutic potential of phytochemicals, highlighting their analgesic, anti-inflammatory, and neuromodulatory characteristics. Essential bioactive chemicals, including alkaloids, flavonoids, terpenoids, and polyphenols, have proven effective in regulating pain pathways, encompassing nociceptive, inflammatory, and neuropathic mechanisms. Curcumin derived from *Curcuma longa* demonstrates COX-2 inhibition and antioxidant properties, whereas cannabinoids from *Cannabis sativa* engage with the endocannabinoid system to mitigate neuropathic pain. The significance of developing technologies, including nanotechnology and bioinformatics, in improving the bioavailability and targeted administration of phytochemicals is emphasized, highlighting the potential for more effective pain management approaches. Notwithstanding these advancements, problems persist, including heterogeneity in plant extracts, a paucity of clinical trials, and regulatory obstacles. Addressing these deficiencies necessitates a multidisciplinary strategy that incorporates pharmacology, molecular biology, and clinical research to standardize formulations and guarantee safety and efficacy. This review highlights phytotherapy as a sustainable and integrative method for managing chronic pain, harmonizing traditional medicinal traditions with contemporary scientific advancements.

Keywords: Phytotherapy, Herbal Medicine, Phytomolecules, Pain Management, Analgesic

HEALTHMEDICON/25/PP-091

PHYTOCHEMICALS IN CANCER THERAPY: A REVIEW OF EFFICACY AND MECHANISMS

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One of the leading causes of death in both industrialized and developing nations is carcinoma or cancer. The prognosis for many patients is now poor, despite rigorous therapies. Thus, the search for novel anticancer drugs with increased effectiveness and fewer adverse effects has persisted. Many medicinal herbs have been found to have anticancer properties, both in accordance with traditional advice and experimental studies. Additionally, *in vitro* or *in vivo* or *ex vivo* studies have demonstrated the antiproliferative, pro-apoptotic, anti-metastatic, and anti-angiogenic properties of a number of phytochemicals. However, there is no proof of their therapeutic efficacy, and only a small number have been evaluated in malignant patients. Furthermore, there are no encouraging findings about the anticancer properties of certain phytochemicals; instead, they have only been shown to have positive impacts on cancer-related symptoms or quality of life. Clinical trials have demonstrated the phytochemicals' overall favourable benefits on different forms of cancer, which was the main emphasis of this review. According to the literature review, there was sufficient clinical evidence to support the anticancer benefits of curcumin, green tea, resveratrol, and *Viscum album*. We have tried to understand the pathways in which phytochemicals can disrupt the mechanism of cancer cells' proliferation and showcase the potential of phytochemicals in combating neoplasm and its symptoms.

Keywords: Herbal, Anti-Cancer, Chemotherapy, Cancer Therapy, Drug Resistance

HEALTHMEDICON/25/PP-092

PHARMACOGNOSTIC AND PHYTOCHEMICAL EVALUATION OF *Kalanchoe pinnata* LEAVES

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Kalanchoe pinnata (syn. *Bryophyllum calycinum*), *Bryophyllum pinnatum*, also known as the patharkuchi, Air Plant and belongs from Crassulaceae family. *Kalanchoe pinnata* is a perennial shrub with a maximum height of two meters. Its leaves are smooth, meaty, and have brownish edges. Tiny plantlets are produced by the leaves, and these might break off and develop into new plants. The bark and leaves are used as an astringent, a bitter tonic, and acne remedy. Additionally, the leaves' juice is used to treat coughs, earaches, and vomiting. anticancer activities of the leaf were also reported. Several other biological activities have been reported for *Kalanchoe pinnata* Linn. This plant has hepatoprotective activity and is also used to increase vascular integrity, to treat hypertension and kidney stones. *Kalanchoe pinnata* contains a wide range of active compounds, including alkaloids, triterpenes, glycosides, flavonoids, steroids, bufadienolides, lipids and organic acids. We are performed the extraction of the leaves through

maceration process. To identify the phytoconstituents from the leaves, we performed different phytochemical tests with leaf extract and performed transverse section microscopy to understand its anatomy and possibly investigate the potential medicinal uses of the leaves. Based on the above test result we concluded that alkaloids, triterpenes, glycosides, flavonoids, steroids, lipids etc. are present in the *Kalanchoe pinnata*.

Keyword: *Kalanchoe pinnata*, *Bryophyllum pinnatum*, Patharkuchi, Maceration process

HEALTHMEDICON/25/PP-093

Crystallo-Co Agglomeration: A Breakthrough in Particle and Material Engineering.

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A drug that has crystallized and agglomerated with an excipient or another drug which may or may not have crystallized in the same system is known as crystallo-co-agglomeration. Temperature, agitation speed, and the kind, quantity, and manner of adding the bridging liquid were among the many factors that were optimized. Drugs with or without excipients from a good solvent and/or bridging liquid are crystallized and aggregated simultaneously during the CCA process by adding a non-solvent. One of the most recent developments in this field is the creation of crystal agglomerates and drug-excipient co-agglomerates to enhance the flow property. The novel process known as crystallo-co agglomeration (CCA) was created with the goal of giving medications favourable mechanical and micromeritic properties. Drug development is being hampered by the active moiety's weak solubility, which could lessen the medication's efficiency when taken orally. One of the newest methods for enhancing a therapeutic molecule's solubility, melting point, pharmacokinetics, pharmacodynamics, and bioavailability is cocrystal formation. Crystallo-co-agglomeration is a kind of spherical agglomeration technology that allows two or more pharmaceuticals to crystallize and agglomerate concurrently, producing complex drug and excipient agglomerates. Cocrystals can be prepared using a variety of methods, including cooling crystallization, grinding, and solvent evaporation. Excipients (such as disintegrants for tablets that dissolve quickly), additional medications (to create a combination tablet), and other polymer combinations (to alter the drug release characteristics) can also be added. By allowing for quicker operation, less equipment, and fewer workers, it saves time and money.

Keywords: Crystallo-co-agglomeration, Coformers, Bioavailability, Micromeritics, Stability, Solubility

HEALTHMEDICON/25/PP-094

A TOUCH OF GREEN : NATURE'S BLUEPRINT FOR ARTIFICIAL HEARTS

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The development of bioengineered artificial human hearts represents a significant leap in regenerative medicine and organ transplantation. The natural vascular structure of spinach

leaves, have pioneered an innovative approach to create scaffold systems for cardiac tissue engineering. This process involves decolorizing spinach leaves to remove plant cells, leaving behind the cellulose-based vascular framework, which mimics the intricate capillary networks of human tissue. Once seeded with human heart cells, the scaffold supports cell attachment, growth, and functionality, enabling the creation of functional cardiac tissue. This poster explores the methodology, and implications of using plant-based scaffolds in artificial organ development, emphasizing their cost-effectiveness, biocompatibility, and scalability. Additionally, it discusses challenges, such as optimizing cell integration and vascularization, and future directions toward creating fully functional bioengineered hearts for transplantation, this approach has the potential to address the global shortage of donor organs and revolutionize the field of tissue engineering.

Keywords: Artificial human hearts, Cellulose – based vascular framework, cardiac tissue engineering, plant based scaffolds.

HEALTHMEDICON/25/PP-095

UNLOCKING THE POWER OF BITTER MELON: A NATURAL REMEDY FOR HEALTH AND WELLNESS

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Bitter melon (*Momordica charantia*) has been used for diabetes management in various regions, including Asia, South America, India, and East Africa. Despite its widespread use, standardized information on its efficacy as an anti-diabetic agent remains limited. Research estimates indicate that up to one-third of diabetic patients utilize complementary and alternative medicine, with bitter melon being a popular choice. Bitter melon, through animal studies and clinical trials, has been shown to improve insulin sensitivity, regenerate pancreatic islets, and increase the secretion of insulin. It also prevents hyperglycemia by adjusting intestinal flora, inhibiting glucosidase and amylase, scavenging free radicals, activating AMP-activated protein kinase (AMPK), and increasing the expression of peroxisome proliferator-activated receptors (PPARs). It also functions as a glucagon-like peptide-1 receptor (GLP-1-R) agonist and 11-hydroxysteroid dehydrogenase type 1 inhibitor, displaying strong hypoglycemic activity. Other reported properties include antiviral and antineoplastic effects. Clinical trials indicate that bitter melon juice, fruit, and powder are moderately hypoglycemic, but have adverse effects including hypoglycemic coma, convulsions in children, and a reduction in mouse fertility. However, bitter melon is still promising, although its use has to be done with caution as it may interact with other glucose-lowering agents, and there is not enough information to allow it to be applied unsupervised.

Keywords: Bitter Melon, Diabetes Management, Hypoglycemic Effects, Insulin Sensitivity, Complementary Medicine

HEALTHMEDICON/25/PP-096

BIO BASED AEROGELS: RECENT TREND IN DRUG DELIVERY

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Biobased aerogel has drawn interest as a possible medication delivery method for use in biomedical settings. Because of the unique physical and chemical characteristics, it is used in applications like as medication delivery, tissue engineering, biosensing, diagnostics, and medical implants. Biopolymers commonly available are cellulose, chitosan, starch, silk fibroins, collagen, albumin, gelatin, alginate, agar, protein, and peptides. These biopolymers were used to create biopolymer-based aerogels, that aided in the delivery of several intelligent therapeutic agents, including genes, anticancer agents, protein medicines, vaccinations, antibiotics, and antibacterials. Aerogels based on biopolymers are effectively avoiding many of the problems associated with traditional delivery methods. Bio aerogels are used as dressing sheets for superficial and chronic wound healing, oral insulin delivery, delayed anticancer medication release, and more. Bioaerogels have also been evaluated for vaccine and gene delivery, as well as various proteinaceous agents, due to their ability to condense, interact with nucleic acids, and undergo chemical changes in target cells. The various uses of biopolymer-based aerogel drug delivery technology are discussed in this review paper, along with a functional analysis of the issues with traditional drug delivery methods.

Keywords: Aerogel, Biopolymer, Drug delivery system, Antibiotic.

HEALTHMEDICON/25/PP-097

THE ROLE OF ROBOTIC SURGERY IN ADVANCING MINIMALLY INVASIVE PROCEDURES: INNOVATIONS, BENEFITS, AND CHALLENGES

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Robotic surgery has revolutionized the field of minimally invasive surgery by enhancing surgical precision, reducing human inaccuracy and improving patient outcomes. The most widely used robotic platform, the da Vinci Surgical System, enables surgeons to perform complex procedures with improved dexterity, high-definition 3D visualization, and enhanced flexibility, all through small incisions. These advancements lead to reduced postoperative pain, shorter hospital stays, and faster recovery times for patients. Robotic surgery is now applied across various specialties, including urology, gynaecology, cardiothoracic surgery, and colorectal surgery. However, despite its widespread implementation, challenges such as the high cost of robotic systems, the need for specialized training, and the limited availability in low-resource settings persist. This review discusses the most recent innovations in robotic surgery, its clinical applications, the benefits to both patients and surgeons, and the challenges obstructing its broader implementation. We also explore the future of robotic surgery, particularly with the integration of artificial intelligence and machine learning for even more precise and personalized care.

Keywords: Robotic surgery, Minimally invasive surgery, da Vinci Surgical System, Surgical robotics, Precision surgery, Surgical innovation.

HEALTHMEDICON/25/PP-098

REVOLUTIONIZING COLORECTAL CANCER TREATMENT: ADVANCES IN NANOMEDICINE AND TARGETED DRUG DELIVERY-A REVIEW

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Cancer is one of the diseases that result from cell duplication in an uncontrolled way and is capable of spreading around various parts of the body. Cancer causes over 10 million deaths annually, according to the World Health Organization. Among the different ones, colorectal cancer, colloquially bowel cancer, remains the third most common type of global cancer, whereby 930,000 deaths occurring in 2020. Cancer that forms mainly in the colon, an important part of the large intestine, which assimilates digesting food substances into faeces, tends to be deadliest if not addressed in time and treated. Nanomedicine, a science based on nanotechnology, brings new ways to diagnose and treat colorectal cancer. It makes it possible to repair, regenerate, and monitor at the atomic or molecular level. Recent developments in Nanomedicine have brought forward chemotherapeutic drugs, biological agents, immunotherapeutic agents, and drug delivery systems that are based on nanotechnology to treat effectively. This poster discusses the latest developments in Nanomedicine, specifically in Nanocarriers, which can improve the targeting precision of colorectal cancer therapies, reduce side effects, and increase therapeutic efficacy.

Keywords: Colorectal Cancer, Nanomedicine, Targeted Drug Delivery, Nanocarriers, Cancer Therapy Innovations

HEALTHMEDICON/25/PP-099

INVESTIGATING THE MOLECULAR MECHANISMS OF HMPV PATHOGENESIS AND ASSESSING NOVEL THERAPEUTIC APPROACHES

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Human metapneumovirus (HMPV) is a significant respiratory pathogen responsible for severe infections in infants, the elderly, and immunocompromised individuals. Despite its clinical importance, no licensed vaccines or specific antiviral treatments exist. Understanding the molecular mechanisms of HMPV pathogenesis is crucial for developing targeted therapeutic strategies. We investigate the key viral proteins involved in HMPV entry, replication, and immune evasion, focusing on the F (fusion), G (attachment), and SH (small hydrophobic) proteins. We also examine host-pathogen interactions, including interferon suppression, immune modulation, and inflammatory responses. Additionally, we assess novel therapeutic approaches, including fusion inhibitors, RNA polymerase inhibitors, monoclonal antibodies, and host-directed therapies that target key viral-host interactions. Our findings highlight the role of the F protein in viral entry and pathogenesis, revealing potential targets for antiviral interventions. We demonstrate how HMPV modulates the host immune response by interfering with type I/III interferon pathways. In therapeutic assessments, fusion inhibitors and polymerase-targeting antivirals show promising in vitro efficacy, while host-directed strategies

reduce viral replication and inflammation. Understanding the molecular pathogenesis of HMPV provides critical insights for the development of targeted antiviral therapies. Our findings support the advancement of novel inhibitors and immunomodulatory strategies as potential therapeutic interventions against HMPV. Future research should focus on in vivo validation and clinical translation of these approaches.

Keywords: HMPV, pathogenesis, immune evasion, antiviral therapy, fusion inhibitors, host-directed therapies

HEALTHMEDICON/25/PP-100

ADVANCEMENT IN UTILIZING *MORINGA OLEIFERA* FOR ANTIVIRAL PURPOSES

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The research explores *Moringa oleifera*, known as the drumstick tree, for its medicinal potential against viral infections like HSV-1 and NDV. Belongs to the family Moringaceae. This plant, rich in bioactive compounds, exhibits anti-inflammatory, antioxidant, and antiviral properties. Methanolic extracts from its leaves have shown promising results in combating HSV-1, which causes oral and genital herpes, and NDV, a deadly virus in birds. These extracts not only possess antiviral effects but also enhance cellular immunity, making them effective immune boosters. By reducing toxicity and improving efficacy compared to synthetic drugs, *Moringa oleifera* offers a natural alternative in treating infectious diseases. Ongoing studies aim to refine formulations to maximize therapeutic benefits, highlighting its potential for future antiviral treatments. This research underscores the importance of exploring plant-based remedies like *Moringa oleifera* amidst the ongoing quest for effective treatments against a spectrum of viral diseases. The world continues to grapple with numerous infectious diseases, including COVID-19, Herpes, AIDS, and Tuberculosis. In addition to these, various viral infections such as HIV, HSV, HBV, EBV, FMDV, and NDV remain prevalent. While numerous synthetic drugs have been developed or are under development to address these conditions, several herbal remedies offer potential therapeutic benefits. These natural remedies can reduce toxicity and enhance efficacy. Ongoing research aims to develop more effective formulations using *Moringa oleifera*, which hold promise for future treatments.

Keywords: *Moringa oleifera*, Methanolic extracts, Antiviral, HSV-1, NDV.

HEALTHMEDICON/25/PP-101

NOURISHING YOUR GUT: THE ROLE OF PROBIOTICS, PREBIOTICS, AND LIFESTYLE

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Our GIT harbours a dynamic association of microorganisms popularly known as the gut microbiome, encompassing bacteria, viruses, fungi, and parasites. Even though the gut microbiota differs among individuals, it remains crucial for preserving general health. The gut microbiome, containing billions of microbes, impacts all critical processes from immunological responses to digestion. Most early research on the microbiome was descriptive, but new developments in molecular techniques have opened doors to further analysis and creative methods. For optimum health, these microbes must be in balance; an imbalance, known as dysbiosis, results in a host of health problems. This equilibrium may be upset by elements such as exposure to the environment, lifestyle, and food. This study examines how dietary decisions, probiotics, and prebiotics may influence gut microbiota, potentially offering remedies for diseases such as obesity and metabolic disorders. Probiotics, such as *Lactobacillus* strains, and prebiotics, which feed beneficial gut flora, can greatly enhance gut health and metabolic results. We will thus be able to develop individualized treatment plans to prevent and treat illnesses associated with microbial imbalances by understanding and adapting the gut microbiome, which will eventually promote improved general health.

Keywords: Human gut microbiome, probiotics, prebiotics, obesity, microorganisms, Dysbiosis.

HEALTHMEDICON/25/PP-102

EXPLORING WIDOWS THRILL: PHARMACOGNOSY, CULTIVATION, PHYTOCHEMISTRY, AND PHARMACOLOGICAL POTENTIAL AND ITS FUTURE IMPLICATIONS

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Widows thrill is a plant mainly grown naturally in the wild islands of Madagascar ,the name widows thrill is given due to the plants tendency to bloom when other plants are dormant in the winter, scientific name of widows thrill is *kalanchoe blossfeldiana* which belongs to the family of Crassulaceae ,this plant is grown in warm and humid climate, its got several colourful flowers of Red, Pink ,Orange and can be used as decorative in house. This plant also has two active ingredients bufadienolids as plant steroid consist of (24 carbon) classified under cardiac glycoside used for immunomodulatory, flavonoids as antioxidant prevents oxidative stress caused by reactive oxygenated species (ROS) like (H₂O₂) or (superoxide) for medical purpose its is used as Antimicrobial, Cardioprotective , Rheumatism, Wound Healing, Antiulcer ,skin lesion , anti-fungal and also as a natural air purifier which also has mood boosting property. In this review of widows thrill the

implications can be of cultivation, collection, pharmacognosy with its future implication of *kalanchoe blossfeldiana* plant.

Keywords: *kalanchoe blossfeldiana*, Crassuleaceae, Pharmacognosy, Antimicrobial, Immunomodulatory

HEALTHMEDICON/25/PP-103

AN OVERVIEW ON SAFETY AND TOXICITY ON HAIR DYES IN COSMETIC SCIENCE.

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The hair dyes are cosmetic product category used for coloring hair, which can be temporary or can be permanent. It's also classified into four parts': Permanent, Semi-permanent, Demi permanent, Temporary. The Hair Dyes are used and it's popular worldwide, and there is an urgent need to understand the toxicities and risk , which associated with the chemicals found in hair dye formulations. These hair dyes are categorized in two terms which is as oxidative and nonoxidative. Their for several years or for the several decades, The Cosmetic Ingredient Review (CIR) which studies individual chemical compounds as they are used in cosmetic products. The comprehensive review of hair dye ingredients and the risks of hair dyeing are not documented. But there are still after the reviewing there some toxicities are associated with hair dyeing and also the carcinogenic risk related to hair dyeing. Still there are many compounds present which are considered as safe. The data of hair dye formulations is very conflicting. The CIR ratified a number of coloring ingredients for hair dyes and banned a series of chemical as carcinogenic. There from the above review there a question which is came out whether personal or occupational hair dyeing increases the risk of the cancer. There are some report where are mentioned about the cancer which is happening by the use of the hair dyeing. Thus there is an urgent need to understand the safety, toxicities and risks associated with the use of hair dyes.

Keywords: Hair Dyes, Cosmetic Ingredient Review (CIR), Toxicities

HEALTHMEDICON/25/PP-104

NATURAL APPROACHES TO ENHANCE WOUND HEALING: PHASES, CHALLENGES, AND PHYTOMEDICINE POTENTIAL

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Wound healing is a natural process in which the body repair its damaged tissue.Wound can be of different kinds including open wound and closed wound. It can be further be classified as primary, secondary, tertiary. Wound can be healed by improving the blood flow and oxygenation or by increases platelet aggregation and also by macrophage transition from pro-inflammatory to anti-inflammatory. Healing consists of different phases like homeostasis where at initial stages the blood vessels constricted by platelets aggregation then inflammation occurs by the neutrophil and macrophage migration, then proliferation stage occurs and lastly

maturity and remodelling. Healing process can be affected by various factors like poor blood circulation or if the patient is diabetic. Hyperglycaemia impairs wound healing via free radical damage or else via disrupting the protein synthesis migration and proliferation of keratinocyte and fibroblast. The phytomedicines for wound healing are not only cheap and affordable but are also profoundly safe. Natural agents induce healing and regeneration of lost tissue by various mechanism. Curcumin possesses anti-bacterial, anti-fungal and anti-inflammatory action. Oil of Cedrus deodara possess anti-inflammatory and anti-microbial activity. Azadirachtin also possess anti-microbial activity. Anthraquinone found in aloe vera helps to heal minor burn and cuts. *Lantana camara* have anti-inflammatory and wound healing properties. Hypericum species has a remarkable effect in lacerated and suppurated wounds with restoration of tissue. *Hydnocarpus wightiana* administered topically to heal the wounds and gangrene faster in leprosy and diabetic patients. *Jasminum auriculatum* contributed to improved tensile strength early phase of healing. This review highlights the potential of natural agents to improve the wound-healing process, addressing challenges like impaired healing in diabetic conditions. By understanding the mechanisms underlying these phytomedicines, their integration into therapeutic practices can be optimized to enhance patient outcomes.

Keywords: Wound healing, Phytomedicines, Regeneration, Anti-inflammatory effect

HEALTHMEDICON/25/PP-105

NUTRACEUTICALS: A NATURAL APPROACH TO MANAGING PCOS

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Polycystic Ovary Syndrome (PCOS) is a complex endocrine disorder that affects women of reproductive age, characterized by hormonal imbalances, insulin resistance, chronic inflammation, and metabolic disturbances. Conventional treatments such as hormonal therapies and insulin-sensitizing drugs provide relief but have side effects and limited efficacy, making the need for complementary approaches evident. Nutraceuticals, derived from natural sources, have emerged as promising alternatives in PCOS management due to their safety profile and multifaceted benefits. This presentation discusses the possible use of inositol, omega-3 fatty acids, vitamin D, N-acetylcysteine (NAC), curcumin, and probiotics as fundamental nutraceuticals in the management of both the cause and symptoms of PCOS. While inositol enhances insulin sensitivity, restores ovulatory cycles, and modulates hormonal levels, omega-3 fatty acids and curcumin decrease inflammation and improve lipid profiles. Vitamin D and NAC enhance glucose metabolism and modulate oxidative stress, whereas probiotics improve gut health-affecting systemic inflammation and hormonal balance. Mechanistically, nutraceuticals target insulin resistance, inflammation, and hyperandrogenism in a holistic way to manage the symptoms and fertility enhancement. There are clinical studies that show them to be very effective in helping improve menstrual regularity, lower androgen levels, and optimize metabolic health and, therefore, are valuable adjuncts to lifestyle interventions such as diet and exercise. As awareness increases, nutraceuticals may play a revolutionary role in the management of PCOS through a safe, natural, and effective approach. This presentation underscores the need for further research to establish standardized protocols and optimize their integration into clinical practice.

Keywords: Polycystic Ovary Syndrome (PCOS), Nutraceuticals, endocrine disorder

HEALTHMEDICON/25/PP-106

ZEBRAFISH AS A NOVEL MODEL SYSTEM FOR DEVELOPMENTAL TOXICITY

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The assessment of developmental and reproductive toxicity is a crucial part of new drug safety profiles. Numerous drug possibilities have detrimental impacts on development and reproductivity, according to preclinical studies. The existing rodent-based rules and regulations are failing to maintain with the increasing toxic exposures that are found and the increasing evidence that these exposures are harmful to the embryos. The vertebrate, a nonrodent test organism, Zebrafish (*Danio rerio*) has emerged as a valuable substitute model organism for high-throughput developmental toxicity studies due to the high expense and long-term evaluation of developmental toxicity studies in mammals. The zebrafish very small size, diverse adaptability, low cost, high fertility rate, short breeding cycle, and transparent embryos have made it a popular model organism in many different professions. The techniques of chemical exposure, the evaluation of morphological abnormalities, housing conditions and their impact on the development of healthy embryos, and future directions are the main topics of this review, which covers zebrafish developmental toxicity studies. As a model for systems toxicology, zebrafish may help clarify developmental toxicity pathways and offer a reliable foundation for risk evaluations related to human health.

Keywords: Zebrafish, developmental toxicity studies, chemical exposure, diverse adaptability, embryos.

HEALTHMEDICON/25/PP-107

A TOUCH OF GREEN: NATURE'S BLUEPRINT FOR ARTIFICIAL HEARTS

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The development of bioengineered artificial human hearts represents a significant leap in regenerative medicine and organ transplantation. The natural vascular structure of spinach leaves have pioneered an innovative approach to create scaffold systems for cardiac tissue engineering. This process involves decolorizing spinach leaves to remove plant cells, leaving behind the cellulose-based vascular framework, which mimics the intricate capillary networks of human tissue. Once seeded with human heart cells, the scaffold supports cell attachment, growth, and functionality, enabling the creation of functional cardiac tissue. This poster explores the methodology, and implications of using plant-based scaffolds in artificial organ development, emphasizing their cost-effectiveness, biocompatibility, and scalability. Additionally, it discusses challenges, such as optimizing cell integration and vascularization, and future directions toward creating fully functional bioengineered hearts for transplantation, this approach has the potential to address the global shortage of donor organs and revolutionize the field of tissue engineering.

Keywords: Artificial human hearts, Cellulose – based vascular framework, cardiac tissue engineering, plant-based scaffolds.

HEALTHMEDICON/25/PP-108

WASTE TO WEALTH: GREEN SYNTHESIS OF NANO-CELLULOSE FROM AGRO-INDUSTRIAL WASTE

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In recent decades, nanotechnology has been increasingly significant not just in research but also in various industries. Current studies indicate that agricultural waste can serve as a potential raw material for producing nanocellulose, which can be utilized in numerous applications such as drug delivery, wound healing, and tissue engineering. Its properties of being biocompatible, non-toxic, and possessing a large surface area make it an excellent candidate for biomedical uses. The cell wall of a lignocellulosic plant largely comprises cellulose. This material contains a considerable amount of microfibrillized and interconnected linear D-glucose units. The configuration of the fiber cell walls is influenced by the interactions between these Van der Waals forces and microfibrils. The term "nanocellulose" refers to cellulose that has one dimension within the nanoscale range. Most sources of nanocellulose come from microorganisms, animals, and plants. However, agricultural and wood waste are considered the two main sources for the production of nanocellulose. The lignocellulosic fibers derived from agricultural waste are significant due to their abundance, cost-effectiveness, renewability, and biodegradability. Fibers from plants that contain a relatively high amount of cellulose are chosen for producing nanocellulose biocomposites, as they can help mitigate environmental pollution, preserve forest resources, and add value to agricultural waste fibers.

Keywords: Nano cellulose, Agro-waste, Lignocellulosic fibers, Biocomposites

HEALTHMEDICON/25/PP-109

MENSTRUAL BLOOD-DERIVED STEM CELLS– AN INTRIGUING DEVELOPMENT IN REGENERATIVE MEDICINE

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There are around 450 menstrual cycles to a woman in her lifetime, with the endometrium being repaired, regenerated, and repaired again. Such cycles add potential in terms of developing the idea of menstrual blood as a source of stem cells for regenerative medicine. Menstrual blood carries stem cells that can be used for medicinal purposes, which are known as MenSCs, while undifferentiated, and could differentiate into multiple cell lineages, with a high proliferation rate. These properties of the MenSCs substantiate that they can signify working as a promising resource for medical science. One point would be that MenSCs would never be caught up by any ethical controversy since routine tapping of their cells reduces the inherent potential

problems associated with collecting tissue-specific somatic cells. These harvested cells can be stored in sufficient numbers for autologous applications without any limitations in differentiation making them an ethically acceptable option. MenSCs are expected to exhibit a regenerative potential to induce healing in many degenerative diseases such as diabetes, stroke, endometriosis, and Alzheimer's disease. First reports regarding MenSCs in animal models have shown promising results with no toxicity upon their use; in fact, they proved that these cells are safe and effective in the research arena. Of course, the manipulation of specific properties of MenSCs has to be worked out according to the needs related to the type of degenerative process under study. Yet, finding out the full potential that a specific MenSC type holds still, for most aspects, does grant a promising alternative from the perspective of regenerative medicine in general and the treatments for degenerative diseases.

Keywords: MenSCs, Regenerative medicine, Differentiation, Diabetes, Alzheimer's disease

HEALTHMEDICON/25/PP-110

SPINACH LEAF HEART- INNOVATION OF A CONTRACTING BIOMATERIAL

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Cardiovascular disease (CVD) is the world's leading cause of death. Myocardial infarction results from occlusion of coronary arteries, tissue ischemia, and cell necrosis that follow. The condition impairs the heart's ability to contract and is usually accompanied by heart failure; in extreme cases, heart transplantation becomes inevitable. The challenge lies in the shortage of organ donors. In a groundbreaking study, Glenn R. Gaudette and his team at Worcester Polytechnic Institute demonstrated the potential of using spinach leaves as scaffolds to grow human heart tissue. Spinach leaves, rich in nutrients beneficial for the heart, may also serve as biological patches or grafts for repairing damaged heart tissue. Furthermore, spinach-based products may be used for developing biocompatible coatings or agents for heart transplant surgeries as less expensive and readily available alternatives compared with those conventionally used. This technique promises much, though challenges are apparent; these include rejection by the immune system, spinach leaf and human heart tissue may be structurally different, issues of consistency and reproducibility, safety concerns, and the regulatory environment. This is research at a preliminary stage, thus further studies and technological development would be needed for this concept to be translated into clinics, and finally, it might lead to innovative solutions for the transplantation of the heart and regeneration of organs.

Keywords: Myocardial infarction, Heart failure, Scaffold, Spinach leaf, Heart transplant

HEALTHMEDICON/25/PP-111

PHARMACEUTICAL TECHNOLOGY THROUGH THE LENS OF ARTIFICIAL INTELLIGENCE: RECENT ADVANCES

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Artificial intelligence (AI) is transforming pharmaceutical technology by increasing efficiency, precision, and speed in drug development and production. Recent advances in AI-powered solutions are revolutionizing areas such as drug discovery and personalized medicine. Prediction modelling and process optimization Machine learning algorithms analyse large data sets to identify new drug candidates. Reduces the time and costs of traditional discovery methods to accelerate therapeutic compounds. Deep learning techniques are used in molecular docking. Prediction of protein structure and a virtual AI screening system for personalized medicine Genetic and clinical data can be analysed to develop customized treatment regimens. Improve patient outcomes and reduce side effects. In addition, AI-powered prediction models optimize production processes. Monitoring quality control parameters in real-time Ensures consistency and efficiency in drug production. Natural language processing (NLP) tools help improve literature reviews. Patent analysis and regulatory delivery by quickly extracting key insights from unstructured data. Despite its transformative potential, the adoption of AI in pharmaceutical technology brings challenges, including data privacy, Algorithmic transparency, and compliance with regulations. Addressing these challenges requires multidisciplinary collaboration between data scientists. Regulatory agencies and pharmaceutical experts must ensure that AI technology is ethical, safe, and effective. This convergence of AI and pharmaceutical technology Demonstrates a paradigm shift. This paves the way for more innovation, precision, and patient-centeredness. Medical solutions finally, in the field of health care, progress is accelerated. The future promises to integrate AI with emerging technologies such as quantum computers and synthetic biology. This provides limitless opportunities to redefine pharmaceutical innovation.

Keywords: Artificial Intelligence (AI), Personalized medicine, Deep learning, Natural language processing, Quantum computers

HEALTHMEDICON/25/PP-112

COGNITIVE EFFECT AND ANTIPSYCHOTIC TREATMENT

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Cognitive impairments are a core feature of many psychiatric disorders including bipolar disorder schizophrenia bipolar disorder and psychosis that significantly affect the quality of life of patients and their functional These deficits, which include memory attention executive functioning and processing speed are rarely addressed by traditional treatments. Antipsychotic medications are the cornerstone of psychotic disorders therapy and provide basic support throughout the treatment of psychotic disorders. They target positive symptoms such as

hallucinations and delusions by blocking dopamine receptors. First-generation antipsychotics have been found to be poorly effective with regard to cognition and exacerbate some kinds of impairments through potent dopaminergic antagonism. The second generation or atypical antipsychotics modulating the serotonin-dopamine receptor function have only provided a little better profile that are nevertheless inconsistent and modest. The future looks very bright with the new generation of antipsychotics that exert pro-cognitive effects adjunctive treatments including nootropics, glutamatergic agents and cognitive remediation programs for the unmet needs in the domain of treating such deficits. Challenges of cognitive management include variability of response among different patients, complexity in the type of cognitive domain involved and side effects which might hinder compliance. Advancements in personalized medicine and the integrative approaches to treatment could potentially improve the cognitive outcome in patients suffering from psychiatric disorders. This review describes the interaction between cognitive deficits and antipsychotic treatment emphasising the need of innovative approaches in optimizing the effectiveness of both the relief of symptoms and the restoration of cognitive functioning in psychiatric services.

Keywords: Antipsychotic, Cognitive, Bipolar, Schizophrenia, Serotonin-dopamine receptor

HEALTHMEDICON/25/PP-113

FROM SPICE RACK TO MEDICINE CABINET: THE FUNCTIONAL FOOD PROPERTIES OF HERBS

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Herb's numerous medicinal qualities, such as their anti-inflammatory, antibacterial, hypotensive, and antioxidant qualities, herbs are employed in functional foods. These herbs played a crucial role in both traditional medical and culinary techniques. These herbs, which include thyme, ginger, basil, turmeric, Fenugreek and rosemary, are rich in bioactive chemicals that offer a variety of health advantages. The medicinal potential of healthy dietary herbs in controlling and preventing a variety of ailments. These herbs' anti-inflammatory, antimicrobial, and antioxidant qualities have been demonstrated to promote heart health, cognitive function, and immune system performance in addition to having anti-cancer effects, reducing inflammation, improving digestion, and supporting the immune system. They can also help manage blood sugar and cholesterol levels. Beneficial dietary herbs have also been shown to improve general wellbeing, lessen tension and anxiety, and facilitate digestion. It seeks to increase awareness of the significance of beneficial dietary herbs in contemporary healthcare, since including them in our diets can have a significant impact on our health.

Keywords: Bioactive compounds, Heart health, Dietary herbs, Anti-cancer properties, Medicinal herbs

HEALTHMEDICON/25/PP-114

NUTRACEUTICALS IN THE MANAGEMENT OF DIABETES

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One of the most promising methods for the prevention and treatment of many different illnesses is the use of nutraceuticals. Products made from food sources that provide health advantages beyond simple nourishment are known as nutraceuticals. The basic components of nutraceuticals include nutrients, herbal remedies, and dietary supplements, which help to preserve health, fight off various illnesses, and improve quality of life. Globally, the use of naturals, nutritional supplements, and nutraceuticals in medicine has increased in recent years. Herbal medications offer a superior therapeutic choice with less side effects than conventional therapy options, such as synthetic pharmaceuticals, which do not adequately address the therapeutic needs for treating diabetes. A multifactorial metabolic disease, diabetes mellitus is characterised by elevated blood sugar or glucose levels. Extensive attempts are underway to identify a holistic approach by mixing molecules from natural and synthetic medications, despite the fact that drug discovery for this condition has achieved great progress. Together, botanicals, vitamins, minerals, antioxidants, amino acids, and fatty acids—collectively known as "nutraceuticals"—are significant sources of novel treatments for insulin resistance and type 2 diabetes. Numerous nutraceuticals used in clinical practice have been demonstrated to favourably alter a range of biochemical and clinical end points and to target the pathophysiology of diabetes mellitus, metabolic syndrome, and its consequences.

Keywords: Nutraceuticals, diabetes mellitus, treatment, anti-diabetic drugs, herbal.

HEALTHMEDICON/25/PP-115

ANTIMICROBIAL TREATMENT OF POLYMERIC MEDICAL DEVICES BY SILVER NANOMATERIALS AND RELATED TECHNOLOGY

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The study "Antimicrobial Treatment of Polymeric Medical Devices by Silver Nanoparticles and Related Technology" examined silver nanoparticles (AgNPs), a potent instrument for improving the antibacterial efficacy of polymeric medical devices.. Silver nanoparticles have known, strong antiviral, antifungal, and antibacterial properties. Overview of the mechanisms of action of AgNPs against pathogens, methods of incorporation of AgNPs into polymers, and the potential of such materials to reduce infections associated with medical devices, such as implants and catheters. This method offers a potential but complex solution to infection control in medical environments, but it also highlights challenges such as controlled release, nanoparticle stability, and minimisation of possible cytotoxicity.

Keywords: silver nanoparticles, pathogens, catheters, implants, cytotoxicity.

HEALTHMEDICON/25/PP-116

VARIOUS DISEASE IN MYOCARDIAL MUSCLE

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Myocardial diseases refer to a group of conditions, which is affecting the muscular tissue of the heart. These diseases include inflammatory conditions like Myocarditis, Myocardial Ischemia & no inflammatory diseases like Cardiomyopathy, which can impact the structure and function of the heart. Myocarditis is rare, but when it occurs, it is usually caused by an infection in the body. It is mainly swelling or inflammation of the heart muscle in myocardium. In these disease, extra stress are added into heart muscle & making it harder to pump the blood. Chest pain, shortness of breath, arrhythmias (fast heartbeat), fatigue are the main symptoms of these disease. In most cases, myocarditis resolves on its own or with medication. Myocardial Ischemia occurs when the heart muscle doesn't receive enough oxygenated blood due to narrowing of coronary arteries. Chest pain, shortness of breath, vomiting, sweating. Cardiomyopathy refers to disease of the heart muscle or electrical dysfunction. It causes mainly the heart to have a harder time pumping blood to the rest of the body, which can lead to symptoms of heart failure. It's most often passed down genetically from the parent to children. It is leading cause of sudden cardiac death in people under 35 ages. There are 4 main types of cardiomyopathy: Hypertrophic cardiomyopathy, Dilated cardiomyopathy, Arrhythmogenic right ventricle dysplasia, Restrictive cardiomyopathy. Fatigue, dizziness, rapid heart beat, breathlessness, chest pain. 1 in 250 people will develop cardiomyopathy. Myocardial disease is one of the largest medical burdens facing populations of the developed world.

Keywords: Myocardial Muscle, diseases, Ischemia, Cardiomyopathy

HEALTHMEDICON/25/PP-117

ZEBRAFISH: A MODEL ORGANISM FOR CARDIOVASCULAR PHARMACOLOGY RESEARCH

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Zebrafish (*Danio rerio*) have become an important model organism for cardiovascular pharmacology research. They share many genetic similarities with humans, breed rapidly, and have transparent embryos, making them a suitable system to study cardiovascular development and disease. The cardiovascular physiology and pathology of zebrafish are conserved with humans, which makes them a suitable model to mimic different cardiovascular diseases, such as hypertension, cardiac arrhythmias, and atherosclerosis. The use of zebrafish in cardiovascular pharmacology research provides high-throughput screening of compounds, assessment of cardiovascular toxicity, and knowledge of molecular mechanisms behind cardiovascular disease. Moreover, zebrafish are relatively easy to manipulate genetically, which allows investigation of the relationship between genes and function in cardiovascular health and disease. Zebrafish models are also widely used to assess the impact of various drugs on heart rate, contractility and vascular development. With their unique ability to regenerate cardiac tissue, they also help in understanding the cardiac repair mechanisms. Generally, the

zebrafish model provides a great tool for advancing our understanding of cardiovascular pharmacology and developing new therapeutic strategies.

Keywords: Zebrafish, Hypertension, Cardiac Arrhythmias, Atherosclerosis, High-throughput screening.

HEALTHMEDICON/25/PP-118

A REVIEW ON RECENT ADVANCES AND MECHANISMS OF DIABETIC COMPLICATIONS

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It is becoming increasingly clear that a solution is needed not just for the current global diabetes epidemic, but also for its significant consequences, which damage both small and big blood vessels. These problems affect the majority of people with both type 1 and type 2 diabetes. The most common microvascular consequences are renal failure, blindness, and amputations, with current treatments simply delaying disease development. Impaired kidney function, shown as a lower glomerular filtration rate, is also a significant risk factor for macrovascular problems such as heart attacks and strokes. There have been several innovative medicines investigated in clinical trials for diabetes complications, with generally disappointing outcomes. Indeed, it remains unclear which pathways in diabetes complications are primarily protective rather than destructive in terms of their effects on the underlying disease process. Furthermore, ostensibly distinct pathways have strong interactions with one another to aggravate disease. Interestingly, several of these pathways may play important roles not just in complications, but also in the development of diabetes itself. This study seeks to explore both well-validated and hypothetical pathways involved in the development of diabetes complications. Furthermore, new areas of study that require additional examination as possible therapeutic targets in the future will be identified.

Keywords: diabetes epidemic, type 1 and type 2 diabetes, diabetes complications, therapeutic targets

HEALTHMEDICON/25/PP-119

COMPREHENSIVE APPROACH TO DIAGNOSING ERYTHROBLASTOSIS FETALIS

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Blood grouping is classified into two categories based on the surface antigens i.e., ABO and Rh (Rhesus factor) which are extensively utilized globally. The Rh antigen is analogous to one found in the Rhesus monkey. It is also detected on the surface of human red blood cells. Individuals possessing the Rh antigen are designated as Rh⁺, while those devoid of the Rh antigen are classified as Rh-. When a Rh-negative individual is exposed to Rh-positive blood.

It will generate particular antibodies targeting certain Rh antigens. Consequently, the Rh group must also be compatible prior to transfusions. A specific instance of Rh incompatibility has been noted between the Rh-negative blood of a pregnant woman and the Rh-positive blood of the foetus. Rh antigens of the foetus do not encounter the mother's Rh-negative blood throughout the initial pregnancy, as the two blood types are effectively segregated by the placental barrier. However, during delivery, there exists a likelihood of blood exposure between the two parties. In successive pregnancies, the mother's blood begins to produce antibodies against the Rh⁺ blood of the foetus, potentially leading to the destruction of the foetus's RBCs. This may result in anaemia, jaundice, or be deadly to the foetus. This syndrome is also referred as erythroblastosis fetalis. It can be prevented by providing anti-Rh antibodies to the mother promptly following the delivery of the first child. Diagnosis encompasses two methodologies: prenatal and postnatal diagnosis and timely diagnosis of the condition is essential for both the mother and the foetus.

Keywords: Erythroblastosis Fetalis, Blood grouping, Rhesus factor, RBCs

HEALTHMEDICON/25/PP-120

BAEL TREE: THE AYURVEDIC ELIXIR

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The Bael tree (*Aegle marmelos*), a cornerstone of Ayurvedic medicine, is a reservoir of therapeutic benefits. Every part of the tree, including its fruit, bark, flowers, and leaves, has been traditionally utilized for its medicinal properties since prehistoric times. The fruit is known for its efficacy in treating gastrointestinal ailments, while the bark has been valued for its anti-inflammatory and antimicrobial attributes. The flowers are used for their cooling and astringent properties, and the leaves hold a unique place in spirituality, especially in Hindu rituals, where they are offered to Lord Shiva as a symbol of purity and devotion. In the modern era, the Bael tree's bioactive compounds are being explored for their potential in managing diabetes, inflammation, and oxidative stress. Research indicates that Bael-derived extracts exhibit promising pharmacological effects, including antioxidant, antidiabetic, and antimicrobial activities, making it a candidate for integrative healthcare solutions. This study highlights the enduring significance of the Bael tree as a bridge between ancient wisdom and contemporary science, advocating its role in holistic wellness.

Keywords: *Aegle marmelos*, Ayurvedic medicine, Bael leaves, Therapeutic uses, Spirituality

HEALTHMEDICON/25/PP-121

RECENT ADVANCES ON ANTIMICROBIAL WOUND DRESSING

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Skin and soft tissue infections (SSTIs) have substantial morbidity and death rates. Some SSTIs can be successfully treated, but those that involve the subcutaneous tissue, fascia, or muscle can cause delays in healing and could lead to life-threatening diseases. As a result, more effective therapies are needed to address such pathological conditions. Wound dressings containing antimicrobial medicines can minimise bacterial colonisation and infection, promoting faster healing. This paper provides an overview of antibacterial compounds often used in wound dressings, including their method of action. The article also discusses current breakthroughs in clinical therapies and future prospects on antibacterial wound dressings.

Keywords: tissue infections, life-threatening diseases, faster healing, dressings

HEALTHMEDICON/25/PP-122

A REVIEW ON COVID-19 AND ITS IMPACT ON SOCIETY

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On February 11, 2020, the World Health Organisation (WHO) recognised Corona Virus, commonly known as COVID-19, as a disease. It is a respiratory ailment that has an overall influence on the individual's health. The first incidence of COVID-19 was reported in China in December 2019. The World Health Organisation labelled the unique Corona Virus a Pandemic illness in March 2020, indicating that the virus is spreading fast across countries throughout the world. Symptoms of this virus include fever, cough, sore throat, and trouble breathing. Man is a social animal, and social relationships and interactions are crucial for his survival. The unique Corona virus and containment methods offered a barrier to interpersonal and communal connections, which were adversely harmed by social distance and isolation. These social ties, exchanges, and relationships have been a part of human life since the beginning. So, the lack of such a connection undoubtedly leads to stressful states of loneliness, anxiety, despair, mental diseases, health dangers, and a variety of other concerns that affect both the person and society as a whole. This is a Reviewed work that is based on secondary material gathered from a variety of sources, including published and unpublished journal articles, newspapers, books, and reports from various government organisations, non-governmental organisations, and commissions. In this reviewed study, the author attempted to analyse the overall influence of COVID-19 on the individual's life.

Keywords: COVID 19, social, psychological, impact, health, society

HEALTHMEDICON/25/PP-123

ADVANCING NEUROLOGICAL DISORDER MANAGEMENT: EMERGING THERAPEUTIC STRATEGIES THROUGH NANOTECHNOLOGY AND ARTIFICIAL INTELLIGENCE

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Neurological disorder such as alzheimer's disease, schizophrenia, and tourette's syndrome present difficult circumstances for mental health care. This is largely due to the effectiveness of available treatments, their wide range of side effects, as well as the degree to which patients decline the treatment. The integration of nanotechnology and artificial intelligence has proffered an innovative way in addressing these issues. Nanotechnology allows a precise drug administration pass the blood-brain barrier to break down systemic toxicity and enhance drug availability in the CNS. Liposomes, polymeric nanoparticles, and nanoemulsions that are highly advanced in category have shown better results than the conventional dosage form; thus, imparting improved stability and controlled release as well as targeting the neural pathways such as the olfactory channels for direct brain delivery. AI complements these facilities further by predicting descriptive modeling, assisting the effective design of drugs, and adds support for personalized planning. Machine learning algorithms legibly work through complex datasets, revealing biomarkers, enhancing nanoparticle optimization, and predicting disabling responses towards treatment. At the same time, popular AI-driven platforms will self-instruments in real-time monitoring to have a mechanical drug delivery for better control of the system and would aid effective precision medicine built according to a patient's specific species. These technologies mark a whole change in the management of neurological disorders emphasizing safety, efficacy, and personalization.

Keywords: neurological disorder, nanotechnology, artificial intelligence, blood-brain barrier, personalized medicine

HEALTHMEDICON/25/PP-124

PRONIOSOMES: INNOVATIVE PROVESICULAR DRUG DELIVERY SYSTEM

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Nanotechnology is an advancing technology expected to bring revolutionary changes in the field of life sciences including drug delivery, diagnostics, nutraceuticals and biomedical implants. The advance in nanotechnology helps in preparing newer formulations. One of the advancements in nanotechnology is the preparation of 'Pronosome derived' niosomes. An innovative approach to drug administration, vesicular systems can increase the bioavailability of encapsulated drugs and deliver therapeutic action over an extended length of time in a controlled manner. Although liposomes were the first system of this type, they have some disadvantages, such as being expensive and unstable at different pH levels. Niosomes were developed as a simple and dependable laboratory-made alternative to liposomes in order to

circumvent their shortcoming. The provesicular system that was created to address these issues in a fresh and distinctive way consists of proliposomes and proniosomes. A non-ionic surfactant coats the dry, anhydrous formulations known as provesicles, which function as a carrier when combined with water when needed. However, a more recent method called as pro-vesicular carriers was used to get beyond their issues with aggregation, fusion, leakage, sedimentation of vesicles, and sterilisation. In this review, we describe a proniosome, which is a type of provesicular carrier. The mechanism, formulation variables and their effects, preparation techniques, characterisation parameters, and application are all covered in this overview of proniosomes.

Keywords: Nanotechnology, Niosomes, Non-ionic Surfactant, Proniosomes, Provesicles

HEALTHMEDICON/25/PP-125

A REVIEW ON MALARIA: THE PAST AND THE PRESENT

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Malaria is a serious disease caused by parasites of the Plasmodium genus that are transferred to humans by the bite of an infected female mosquito of the Anopheles species. Malaria is the biggest cause of death in the world, and early detection and prompt treatment can reduce negative results. Malaria is the most frequent illness in Africa and several Asian nations, yet in the industrialised world, it is imported from endemic places. In China, the sweet sagewort plant has been used to cure malaria fever since the second century BC. Much later, quinine was utilised as an antimalarial medication. The global war against malaria began in 1955, and Croatia named 1964 the year of malaria elimination. The World Health Organisation implements a global malaria control program, with an emphasis on local primary health care strengthening, early illness diagnosis, prompt treatment, and disease prevention. The global malaria load is lower than it was ten years ago. However, in recent years, the incidence of malaria cases worldwide has increased significantly. It is heading towards WHO objectives, although development has stalled.

Keywords: Anopheles; antimalarials; malaria; Plasmodium

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IMPLANTABLE MICROFLUIDICS: A NOVEL APPROACH IN DRUG DELIVERY SYSTEM

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A revolutionary technique in precision medicine is the combination of implanted medication delivery devices and microfluidic integration. This review provides a comprehensive view of the integration of microfluidics technology into implanted drug delivery systems, emphasizing

the innovative potential, benefits, and underlying challenges of this innovative pairing. Microfluidics' fundamental concepts describe how its use in implanted technology enables precise control over medication release kinetics, dose, and spatio temporal targeting. The advantages of microfluidic-integrated implants are examined, including enhanced therapeutic efficacy, fewer side effects, and flexible real-time drug administration. Also incorporating microfluidics into implanted drug delivery systems provides exact control over drug release, improving therapeutic results, improved patient compliance, less adverse effects, and focused medication distribution are among the advantages. Furthermore, this paper critically examines the constraints and difficulties associated with microfluidic integration, including complexity of the device, biocompatibility, manufacturing scalability, and regulatory considerations. Widespread use of this approach requires addressing issues with device downsizing, biocompatibility, and intricate fabrication procedures. Therefore, this review also attempts to give a thorough grasp of the revolutionary effects and constraints of incorporating microfluidics into implanted drug delivery systems by an analysis of recent research results and technological developments.

Keywords: Microfluidics, implantable drug delivery systems, implants, real-time drug delivery

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UNVEILING THE THERAPEUTIC POTENTIAL OF INDIAN SPICES IN METABOLIC DISORDERS: A NETWORK PHARMACOLOGY AND IN-SILICO APPROACH

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By interfering with metabolic processes and causing serious problems, metabolic illnesses such as diabetes mellitus, Gaucher's disease, hemochromatosis, phenylketonuria (PKU), maple syrup urine disease (MSUD), mitochondrial disorders, and Wilson's disease have a substantial impact on world health. 537 million individuals worldwide suffer from diabetes, with India accounting for approximately 74 million cases and ranking second globally. Around the world, 10–40% of adults suffer with metabolic syndrome; in India, the prevalence is 30%, particularly in metropolitan areas. Due to a lack of data in India, rare metabolic diseases such as Gaucher's disease (1 in 40,000–60,000), hereditary hemochromatosis (1 in 200–500), PKU (1 in 10,000–15,000), and MSUD (1 in 185,000) pose difficulties. Wilson's illness (1 in 30,000) and mitochondrial abnormalities (1 in 5,000 worldwide) highlight the necessity of efficient management techniques. Indian spices have great potential for treating various conditions because of their bioactive components. Turmeric's (*Curcuma longa*) curcumin helps with hemochromatosis and diabetes by lowering inflammation and improving insulin sensitivity. Fenugreek (*Trigonella foenum-graecum*) contains trigonelline, which enhances glucose metabolism. Cinnamaldehyde, which is found in cinnamon (*Cinnamomum verum*), improves insulin receptor function and controls blood sugar. Gingerol in ginger (*Zingiber officinale*) improves lipid profiles and lowers oxidative stress in metabolic syndrome, while piperine in black pepper (*Piper nigrum*) increases metabolism and nutrition absorption. Garlic (*Allium sativum*) contains sulphur compounds that help detoxify and chelate heavy metals, especially in hemochromatosis and Wilson's disease. Cloves (*Syzygium aromaticum*) contain eugenol, which promotes mitochondrial health. Our study establishes the significance of Indian spices

as supplemental therapies for the management of metabolic disorders by using network pharmacology and an in-silico approach to identify molecular pathways and therapeutic targets.

Keywords: Metabolic disorders, Indian spices, network pharmacology, in silico approach, bioactive constituents.

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STRATEGIES FOR THE PREVENTION OF AIDS: PROTECTING LIVES AND COMMUNITIES

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AID is an acronym for acquired immunodeficiency syndrome which indicates an acquired deficit of the immune system, developed during an individual's lifetime. Therefore, it signifies that it is not a congenital disorder. AIDS is caused by the Human Immunodeficiency Virus (HIV). Individuals at elevated risk of contracting this infection include those with several sexual partners, intravenous drug users, individuals requiring frequent blood transfusions, and infants born to HIV-infected mothers. The virus enters the macrophages in the human body, where its RNA genome replicates to create viral DNA with the assistance of the enzyme reverse transcriptase. Subsequently, this viral DNA integrates into the host cell's DNA and governs the infected cell. The macrophages persist in producing a virus analogous to an HIV factor. The HIV infiltrates helper cells and the T-lymphocytes (TH) proliferate and generate offspring viruses that are released in the bloodstream that attack other helper T-lymphocytes. Death of T-lymphocytes leads to weight reduction. The AIDS patient becomes highly immunocompromised that they are unable to defend themselves against these infections. The diagnostic test for AIDS is the enzyme-linked immunosorbent assay (ELISA) and AIDS lacks a definitive cure. The National AIDS Control Organization (NACO) and several NGOs are actively engaged in educating the public about AIDS. HIV can be prevented by the disposal of needles and syringes in public and private hospitals and clinics, the free distribution of condoms, and the regulation of substance addiction.

Keywords: Acquired immunodeficiency syndrome, Human Immunodeficiency Virus, Reverse transcriptase, Enzyme-linked immunosorbent assay, National AIDS Control Organization

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NATURAL PRODUCTS IN DRUG DISCOVERY

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The most effective source of leads for drug development has been shown to be natural ingredients. There are now more than 100 novel pharmaceuticals under clinical development, mostly as anti-infectives and anti-cancer drugs. Novel compounds that are easily produced in bacteria or yeasts are becoming more accessible through the use of molecular biological

techniques, and combinatorial chemistry approaches are being developed based on natural product scaffolds to produce screening libraries that closely resemble compounds that are similar to drugs. Data mining and virtual screening techniques are also being used to databases of natural goods, and a variety of screening methods are being created to make it easier to incorporate natural products in drug discovery campaigns. It is envisaged that using natural goods more effectively and efficiently will enhance the drug discovery process.

Keywords: Drug development, Virtual screening, databases, drugs, natural product

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**A REVIEW ON PLANT BASED ANTIMICROBIAL AGENTS IN THE ERA OF
ANTIBIOTIC RESISTANCE**

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Antimicrobial resistance (AMR) is when micro-organisms stop responding to specific antimicrobials. AMR is due to the misuse of antibiotics leads to the target microorganism such as bacteria, fungi, protozoa or virus to modify itself and develop resistance. Microbes multiply rapidly and pass on their resistant genes through plasmid exchange. As a result, the use of plants is being considered as antimicrobials. According to World Health Organisation (WHO), there have been 1.27 million deaths directly due to AMR and it is also responsible for 4.95 million deaths in 2019 in India. By 2050, 4.7 million deaths will likely be caused by AMR directly. In India, 10% of children below the age of 5 have already become resistant to penicillin while 4% are resistant to cefotaxime. Studies reveal stool samples from 1-3 yr olds containing *E.coli* are 100% resistant to ampicillin. Plant based antimicrobials or ethnomedicine involves the use of the leaves, stems, barks, fruits, seeds, exudates or any such part of plant for its medicinal properties. Bacteria such as *Mycobacterium tuberculosis* have developed multi-drug resistance. Methicillin resistant *Staphylococcus aureus* is one such organism which has developed to all drugs. The various secondary metabolites obtained from plants are phenols (*Anacardium occidentale*, *Ocimum viride*, *Chlorophora excelsa*), quinines (*Plumbago zeylanica*, *Diospyros mespiliformis*, *Drosera indica*, *Embelia schimperi*), acids (*Bryophyllum pinnatum*, *Caloncoba echinata*, *Acacia farnesiana*, *Mangifera indica*), alkaloids (*Argemone Mexicana*, *Chasmanthera dependens*, *Cryptolepis sanguinolenta*, *Solanum nodiflorum*), flavonoids (*Capparis decidua*, *Lepidium sativum*, *Moringa oleifera*, *Carica papaya*), terpenoids (*Borreria verticillata*, *Xylopia aethiopica*, *Azadirachta indica*, *Ekebergia senegalensis*), etc.

Keywords: Antimicrobial resistance, ethnomedicine, plasmid exchange, penicillin, secondary metabolites

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INSULIN NNC2215: A BREAKTHROUGH IN PRECISION MEDICINE FOR DIABETES

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Recent advancements in diabetes treatment have led to the development of NNC2215, a novel form of insulin designed to improve glucose regulation and provide more personalized therapy for individuals with Type 1 and Type 2 diabetes. NNC2215 is a long-acting insulin analogue that features an innovative modification, allowing it to respond dynamically to fluctuating blood glucose levels. The insulin formulation is engineered to self-adjust its activity in response to blood sugar changes, providing more effective glucose control with fewer instances of hypoglycaemia. Unlike traditional insulin therapies, which have a fixed action profile, NNC2215 leverages a smart mechanism that optimizes its effectiveness based on real-time glucose needs. This adaptive behaviour is achieved through a unique molecular structure that enables a rapid onset of action when glucose levels are high and a gradual, prolonged effect when levels stabilize, mimicking the body's natural insulin secretion pattern. In clinical trials, NNC2215 demonstrated significant improvements in glycaemic control, reducing HbA1c levels without an increase in hypoglycaemic episodes. Its potential to reduce the burden of daily insulin injections and enhance patient outcomes positions NNC2215 as a promising therapy for diabetes management. This breakthrough represents a step forward in the development of personalized insulin therapies, offering hope for improved quality of life for millions of diabetes patients worldwide.

Keywords: Smart insulin, NNC2215, glucose regulation, personalized therapy, hypoglycaemia.

HEALTHMEDICON/25/PP-132

NANOSTRUCTURED LIPID CARRIERS FOR TARGETED DRUG DELIVERY ACROSS THE BLOOD BRAIN BARRIER: A COMPREHENSIVE REVIEW

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Nanostructured lipid carriers (NLCs) are a promising advancement in drug delivery systems, specifically designed for overcoming the challenge posed by the blood-brain barrier (BBB). NLCs are second-generation lipid nanoparticles, being uniquely composed of a solid core, surrounded by liquid lipid. This improves stability, drug encapsulation efficacy, and controlled release. Thus, NLCs have become ideal for brain-targeted therapies. This review explores the design, formulation, and therapeutic potential of NLCs in targeted drug delivery to the brain. The review focuses on key strategies implemented to optimize NLCs for BBB penetration. This includes surface functionalization with ligands such as transferrin, lactoferrin, and cell-penetrating peptides to exploit receptor-mediated transcytosis. Additionally, it utilises the role of nanotechnology to enhance the bioavailability of both lipophilic and hydrophilic drugs. It also reduces the risk of systemic side effects. Recent advancements in in vitro and in vivo

studies demonstrate the efficacy of NLCs in delivering therapeutic agents for neurodegenerative diseases like Parkinson's disease and Alzheimer's disease, brain tumours, and psychiatric disorders, showing their potential in precision medicine. The review also discusses current challenges, which includes large-scale production, regulatory hurdles, and long-term safety, emphasizing the need for multidisciplinary collaboration. With ongoing advancements, NLCs stand as a non-invasive, efficient, biocompatible platform for revolutionizing brain-targeted drug delivery and addressing unmet needs in neurotherapeutics. This comprehensive analysis highlights the pivotal role of NLCs in advancing treatment options for central nervous system disorders, offering a pathway toward clinical innovation and improved patient outcomes.

Keywords: Nanostructured Lipid Carrier, Blood Brain Barrier, Targeted drug delivery, Neurodegenerative diseases, Controlled drug release.

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HYPOTHETICAL MODEL FOR THE MONITORING OF CHOLESTEROL WITHOUT ANY INJECTABLES

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High cholesterol is one of the leading health conditions in India, affecting numerous people due to various factors such as lifestyle management, other health issues, and food intake. Blood testing is an essential diagnostic tool for measuring cholesterol levels; however, maintaining healthy cholesterol level is a challenging task. Regularly checking cholesterol levels can be cumbersome. Therefore, a device that can monitor cholesterol levels without invasive methods is highly desirable. We are aware of the potential of metal-organic frameworks (MOFs), which can detect trace amounts of specific compounds based on their structure. Our proposed model involves monitoring cholesterol levels and indicating the results to the user through a color change, facilitated by artificial intelligence (AI). In this model, sweat serves as the medium for measuring the trace amount of cholesterol concentration using a bio-functionalized (MOF) metal-organic framework (in a ring). The ring's screen displays the results, which are processed and maintained by AI. This model has the potential to be used on a daily basis without much technical handling, user friendly, easy to use, hassle free cholesterol level monetization which will help in the maintenance also. The red, yellow, green colour will further indicate the cholesterol level respectively high, at the marginal lining, and normal level. Thus, this plan helps the larger population in the lifestyle management and dietary supplements intake to control it.

Keywords: AI collaboration, cholesterol, cholesterol monitoring, hypothetical model, MOF.

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**TRANSFEROSOMES: A BRIDGING BARRIERS NANOTECHNOLOGY FOR
TRANSDERMAL DRUG DELIVERY**

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Transferosomes are lipid based ultra-deformable vesicles. This are one of the non-invasive and self-administrative drug delivery system with improved patient compliance and adherence drug therapy. Nowadays this nanotechnology gains a lot of attention because of its remarkable ability to penetrate the therapeutic agents. Transferosomes have a special structure made up of phospholipid layers and added edge activators. This gives them the ability to be flexible and change shape, which helps them slip through narrow openings and overcome biological barriers quite easily. To make transferosomes, different methods are used like ethanol injection, reverse phase evaporation, rotary evaporation, and centrifugation. Each method has its own perks, like affecting the size of the vesicles, their stability, and how well they can hold drugs are delivered through the skin, especially for hydrophilic and large molecules that struggle to pass through the skin barriers. The evaluation parameters include vesicle size and zeta potential, the amount of drug they contain, and their turbidity. Other aspects include how easily they can change shape, how well they can penetrate, their occlusion effect, and their surface charge and charge density. Lastly, *in vitro* drug release, skin permeability studies, and their overall physical stability. Transferosomes are an exciting way to improve how we deliver medications. They can lead to better treatment results and open new doors in areas like medicine, beauty products, and biotechnology. Ongoing progress in this area could change how we provide therapies and help meet medical needs that have not been addressed.

Keywords: Transferosomes, Ultra-deformable, Non-invasive, Self-administrative, Nanotechnology, Phospholipid, Edge-activators, Hydrophilic, *In vitro* drug release.

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**BOTULINUM TOXIN FOR POSTHERPETIC NEURALGIA: A NEW FRONTIER IN
PAIN MANAGEMENT**

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Postherpetic neuralgia (PHN), a severe chronic pain syndrome caused by herpes zoster infection, presents substantial hurdles in pain treatment. Conventional treatments, such as analgesics, anticonvulsants, and topical therapy, frequently give little relief and are linked to side effects. Botulinum toxin (BoNT), which is well-known for its cosmetic and neuromuscular uses, has emerged as a viable treatment for PHN. BoNT works by inhibiting peripheral nerve terminals and modulating pain signaling pathways to provide long-term pain relief and diminish hypersensitivity in afflicted regions. Recent clinical investigations have demonstrated its usefulness in relieving pain, enhancing quality of life, and reducing the requirement for systemic drugs in PHN patients. This innovative, minimally invasive method offers a safer option with a favorable side effect profile. However, a more comprehensive study is required to develop standardized dosage procedures and ensure long-term safety. BoNT represents a new frontier in PHN pain therapy, giving hope to patients with refractory pain resistant to conventional therapies.

Keywords: Postherpetic neuralgia, Botulinum toxin, herpes zoster infection, conventional therapies, chronic Pain Management.

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NAFITHROMYCIN: PIONEERING INDIA'S INDIGENOUS ANTIBIOTIC BREAKTHROUGH

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Antimicrobial resistance (AMR) in bacterial pathogens is a significant challenge linked to elevated morbidity and mortality rates. Antibiotic resistance arises when bacteria acquire the capability to endure and proliferate despite the presence of antimicrobial agents intended to eradicate them. Antibiotic resistance is an escalating global concern, necessitating the development of new antibiotics. The improper use and exploitation of antimicrobials are the primary catalysts for the emergence of antibiotic resistance. Bacterial antimicrobial resistance (AMR) accounted for global mortality, as demonstrated in WHO studies from 2019, resulting in around 1.27 million deaths worldwide and contributing to nearly 4.95 million fatalities. There is presently a deficiency of effective medicines, inadequate preventive measures, and a limited selection of antibiotics, necessitating the development of innovative therapeutic alternatives and alternative antimicrobial therapies. One of the therapeutic outcomes that ultimately revolutionized the AMR management is "Nafithromycin" which was introduced after years of diligent effort. This innovative antibiotic is tenfold more effective than existing medicines such as Azithromycin and provides a three-day therapy protocol. It is engineered to combat both conventional and unconventional drug-resistant bacteria, rendering it an essential instrument in tackling the escalating challenge of antimicrobial resistance (AMR).

Keywords: Macrolide, Antibiotic, Antimicrobial resistance, Nafithromycin, Antimicrobials

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ENHANCEMENT OF THE SOLUBILITY BY SOLID DISPERSION: AN OVERVIEW

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Low aqueous solubility remains a significant challenge in the development of both new chemical entities and generic drugs. Approximately 40% of newly discovered drugs are lipophilic and suffer from poor water solubility, leading to slow dissolution rates, erratic absorption, and low bioavailability when administered orally. Among the various strategies employed to enhance solubility, solid dispersion has emerged as a promising approach for improving the dissolution rate and bioavailability of poorly water-soluble drugs. Solid dispersions involve the dispersion of a drug in a carrier matrix, which can be hydrophilic or hydrophobic, to increase the drug's solubility. These dispersions can be tailored into immediate-release or controlled-release formulations based on the properties of the carriers used. Early formulations utilized crystalline carriers, which have been transformed into amorphous solid dispersions, significantly enhancing the solubility characteristics of the drugs. Various techniques for preparing solid dispersions, such as solvent evaporation, melt extrusion,

and hot melt extrusion, are discussed in this review. Additionally, other solubility enhancement methods, such as micronization, chemical modification, and complexation, are briefly explored. The review highlights the molecular arrangements in solid dispersions, their preparation methods, and practical aspects that influence their successful formulation. Solid dispersion technology continues to be a valuable tool in overcoming the solubility limitations of lipophilic drugs, thus improving their therapeutic efficacy and market viability.

Keywords: Solubility enhancement, solid dispersion, bioavailability, lipophilic drugs, dissolution rate.

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**FROM MANUFACTURE TO PATIENT: ENSURING MEDICATION SAFETY
THROUGH QR CODES.**

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Counterfeit Medication are those drugs that are deliberately and frequently manufactured or labelled with respect to its identity or source. According to WHO 25% of medicines consumed in poor countries could be counterfeit or below standard. An estimate suggests that these drugs are a \$200 billion industry worldwide. Since the cost of manufacturing is especially low (40% cheaper) considered to other parts of the world, it makes India an easy target for Counterfeit medication. Counterfeit Medication poses numerous problems around the world among which the common one being health and safety issues. Counterfeit Medication can also harm the economy by leading to legitimate business losing sales and revenue which can lead to layoffs and business closures. Preventing Counterfeit Medication is multi-faceted challenge requiring co-ordinated efforts from multiple regulatory bodies like the government, manufacturers, consumers and lastly the ones in the Healthcare industry. The common methods generally used to tackle these problems consider of strengthening regulatory framework like enforcing proper laws and focusing on licensing and audits. Easily applicable solution may include ideas like secure procurement of the product or using a track-and-trace system. The track and trace system can be easily initiated and can include several steps of verification which leads to the safety of the product which makes it an ideal solution to the counterfeit Medication problem. Usage of Serialization, barcodes, QR codes can help with the monitoring of the product at ease. QR codes play a crucial role as each code is unique and is comparatively hard to tamper considered to others. The proper application of the QR code can depend on various condition and situations.

Keyword: Counterfeit Medication, Business loss, Health issues, Track and trace system, QR code

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DIABETES IN INDIA: A GROWING THREAT TO VISION AND EYE HEALTH

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Diabetes is a chronic disease of major concern across the globe, affecting an estimated 537 million adults worldwide. It has led to estimation records suggesting India to be one of the epicenters of the global diabetes mellitus pandemic. What is particularly serious is that, to tackle it, India needs greater resources and a serious rethinking of its health strategy. India has been increasing its burden of diabetes with fast growth in socioeconomic development and demographic change, which is resulting in an explosive increase, especially in the last four decades, in the prevalence of this condition. The situation is no different in the country, as diabetes prevalence in India has escalated precipitately for both urban and rural populations. Also, several studies find that even cases of prediabetes in South India are very high and a rapid conversion to diabetes has been recorded with 20% in urban populations and 10% in rural populations. It is quite obvious that the direct economic cost in treating diabetes, and its related complications is substantial. In response to the dramatic increase in the prevalence of diabetes in developing countries, it initiated a national program in the late 1950s for its prevention and control. The cost of unmanaged diabetes to the individual and society as a whole is very high. Recurrence in India poses high health risks, especially concerning people with diabetes

Keywords: Diabetes, Prevalence, Socioeconomic, Demographic, Pandemic

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SYSTEMATIC REVIEW ON TANNINS: INSIGHTS, APPLICATIONS, AND THERAPEUTIC POTENTIAL

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A broad class of polyphenolic chemicals present in many different plants, tannins have drawn a lot of interest because of their important medicinal and industrial uses. It is divided into two categories: condensed tannins and hydrolysable tannins. Tannosomes contain condensed tannins, which are inert to plant proteins and are biosynthesised using Malonate or Shikimate Pathways and Calvin cycle byproducts. These mechanisms generate various tannin types by using either the oxidative or glycolytic pentose phosphate pathways. Tannins have a variety of biological functions, such as metal-ion chelation, antibacterial, and antioxidant capabilities. Their therapeutic promise stems from their interactions with polysaccharides, proteins, and lipids, which decrease reactive oxygen species (ROS), improve lipid stability, and inhibit pro-oxidant enzymes. Furthermore, tannins are important for oenology and food preservation. Identification of plant-specific tannin profiles and their characteristics requires an understanding of tannin metabolism. It is vital for identifying plant-specific tannin profiles and their biological effects, fostering their nutraceutical applications. Research focuses on linking tannin biotransformation to their action modes, aiming to decode their local chemical fingerprints and maximize their therapeutic and industrial potential.

Keywords: Tannosomes, Malonate or Shikimate Pathways, Calvin cycle byproducts, Oxidative or Glycolytic pentose phosphate pathways, Reactive oxygen species (ROS),

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SYSTEMIC REVIEW ON LIPOSOMAL DRUG DELIVERY SYSTEM

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Liposomal drug delivery systems (LDDS) represent a revolutionary approach to targeted drug delivery, offering numerous advantages in enhancing the therapeutic index of drugs, reducing toxicity, and improving bioavailability. Liposomes are nanoscale vesicles made of phospholipid bilayers capable of encapsulating hydrophilic and hydrophobic drugs. Their ability to deliver drugs to specific sites, especially in oncology, has led to the development of clinically approved formulations like Doxil® and Ambisome®. These systems leverage passive targeting through the Enhanced Permeability and Retention (EPR) effect, as well as active targeting using ligands such as antibodies or peptides. Furthermore, liposomal platforms have been employed in vaccine development, including those targeting infectious diseases like COVID-19. Despite their promise, challenges persist in achieving scalable manufacturing, long-term stability, and efficient drug loading. Emerging innovations like stimuli-responsive liposomes, hybrid systems, and personalized liposomal formulations aim to address these limitations. Advances in materials science and nanotechnology are pivotal in overcoming these hurdles. Future research will likely focus on optimizing design, reducing costs, and integrating precision medicine approaches. This systematic review explores the current advancements, challenges, and future perspectives in liposomal drug delivery systems. It also includes studies published from 2015 to 2025. The databases searched include PubMed, Scopus, and Web of Science. Articles were selected based on relevance, novelty, and contributions to the field.

Keywords: Liposomes, Nanotechnology, Phospholipid, Permeability.

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ORODISPERSIBLE FILM: A NOVEL APPROACH IN DRUG DELIVERY

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In recent decades, both researchers and companies have focused on developing innovative novel drug delivery systems to enhance safety, efficacy, compliance, and patient acceptability. The processes of drug discovery and development have become increasingly costly, intricate, and time-consuming, leading to a growing interest in novel drug delivery methods. Among these, oral administration remains the most preferred, non-invasive, and commonly utilized route for delivering medications. Various oral dosage forms, including syrups, suspensions, drops, tablets, capsules, and chewing gums, are available; however, each form presents its own challenges regarding administration and dosing. Additionally, certain patient populations, such as those with swallowing difficulties, dysphagia, or a fear of choking, face significant barriers to effective therapy, which can hinder compliance and adherence to treatment regimens. Orosoluble Films (ODFs) are thin, single or multilayer sheets made from suitable materials

designed to quickly release the active ingredient in the mouth, forming a fine suspension or solution in saliva without mastication or water intake. This delivery system facilitates drug action through both local and systemic routes, offering a faster rate of drug absorption, enhanced bioavailability, and improved patient compliance. The innovative approach to formulating orodispersible films is particularly beneficial for pediatric, geriatric, and bedridden patients. Various techniques exist for producing oral films for buccal administration, with the solvent casting method being the most commonly employed. This method utilizes film-forming polymers that ensure rapid disintegration, enhanced drug dissolution, and optimal drug content. Different buccal delivery products have been proposed for treating conditions such as trigeminal neuralgia, diabetes, and Meniere's disease. This review aims to provide comprehensive insights into the preparation, characterization, and evaluation of ODFs, along with their advantages and limitations.

Keywords: Orodispersible Film, Oral Drug Delivery, Bioavailability, Suspension, Dosing, Drug Response, Solvent Casting, Polymer

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BIGELS: A VERSATILE FRONTIER IN DRUG DELIVERY SYSTEMS

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Bigels are biphasic systems formed by water-based hydrogels and oil-based organogels, studied in the last few years for pharmaceutical, food and cosmetic applications. Due to the mixing of two phases of different nature bigels possess some interesting features like ability to deliver hydrophilic and lipophilic drugs, better spreadability and water washability, improved permeability of drugs and enhanced hydration of stratum corneum. A thorough insight into the composition and important characteristics of bigel together with the discussion on preparation of bigel is presented here. The proportion of the gelling agent in each phase, the organogel/hydrogel ratio, the mixing temperature and speed all need to be taken into consideration for bigel manufacturing. Bigels are useful drug delivery systems and have already been formulated for transdermal, buccal, and vaginal routes. The primary focus is on using bigels to administer drugs topically in dermatological treatments for psoriasis, eczema, and fungal infections. The most applicable bigel characterization techniques are rheology, DSC, texture analysis, mechanical assessments, microscopy etc. Different bigel applications in foods as animal fat substitutes are discussed. According to recent studies, bigels can be used as ingredients for total or partial solid fat replacement in complex food matrices. However, several issues remain - formulation stability, issues with patient compliance, and regulatory hurdles that need to be overcome before this potential in pharmaceutical practice can be realized to its fullest. It has focused on very recent advances, formulation strategies, and the future outlook of bigels in the field of drug delivery.

Keywords: Bigels, topical drug delivery, hydrogels, organogels, pharmaceutical applications.

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SAFFRON: STRUCTURAL INSIGHT AS POTENT COMPOUND FOR COGNITIVE ISSUES

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Saffron, sourced from the stigmas of the *Crocus sativus* flower, is a particularly valued spice famed for its extraordinary taste, rich colour, and medicinal attributes. Its cultivation is predominantly focused on regions with Mediterranean climates, which include Iran, India, Greece, and Spain. The exertion-extensive nature of saffron manufacturing, which includes hand-picking and drying the sensitive stigmas, contributes to its fame as one of the international's most pricey spices. The bioactive compounds in saffron, along with crocin, picrocrocin, and safranal, are accountable for its particular sensory houses and ability fitness benefits. Crocin imparts saffron's colourful crimson shade and well-known shows strong antioxidant pastime. Picrocrocin gives the spice's characteristic bitter flavor, while safranal is mainly chargeable for its exceptional aroma. These compounds had been the focal point of big research due to their healing potential. Studies advise that saffron might also have quite a number fitness benefits, consisting of mood enhancement, cognitive development, and anti-inflammatory results. It has been explored as a natural treatment for melancholy, anxiety, and other temper problems. Emerging research also highlights its ability in dealing with situations inclusive of Alzheimer's ailment, cardiovascular sicknesses, and certain varieties of cancer. Despite its excessive value, saffron remains a prized factor in international culinary traditions, adding depth and complexity to diverse dishes. Its rich records, cultural importance, and promising fitness benefits make saffron a spice of each culinary and medicinal significance.

Keywords: Saffron, *Crocus sativus*, Anti-inflammatory, Alzheimer disease.

HEALTHMEDICON/25/PP-145

UNLOCKING NEW HORIZONS IN OSTEOARTHRITIS: FROM CAUSES TO CURATIVE APPROACHES

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This is a very common inflammatory disorder affecting the articular cartilage, osteoarthritis (OA). It is accompanied by hypertrophic bony changes. Genetic predisposition includes the female gender, history of previous trauma, advancing age, and obesity-all of which are considered to be risk factors. Presentation is usually of joint pain exacerbated by movement and lack of movement; pain prevents or changes one's style of doing routine activities. Routine plain X-ray examination and the patient's story remain as two precious diagnostic instruments that, most of the time, are not taken into account. Usually, this remains the primary complaint and rationale for patients to seek medical assistance for pain. Treatment pharmacologic agents are relatively initial treatment options with acetaminophen and possibly with NSAID

monotherapy if required. Physical and other non-pharmacologic treatments could be added to relieve and enhance mobility in some cases. Most often, the therapy involves the patient receiving prescriptions for heavier analgesics. There have been reports of the use of intra-articular hyaluronate and COX-2 inhibitors for some patients not responsive to analgesics in the therapy of the osteoarthritic joint. Less strong, but also less hazardous, analgesia is provided by glucosamine. In a more severe course, surgical methods, especially joint replacement, are options. Spifermin is a truncated human FGF18 capable of inducing cartilage matrix and chondrocyte growth. Its intra-articular application to help in OA is part of a phase II study of clinical screening in radiologically confirmed OA patients. These are the areas of continuity in managing OA by steps.

Keywords: Osteoarthritis, Inflammation, Pharmacologic therapy, Joint replacement, Spifermin

HEALTHMEDICON/25/PP-146

PAPAYA GUM: VERSATILE APPLICATION IN THE CURATIVE FIELD.

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Papaya (*Carica papaya L.*) is a tropical fruit known for its rich nutritional content and medicinal properties. Apart from its fruit, the papaya tree produces a milky latex, which contains papain, a proteolytic enzyme widely used in the pharmaceutical, food, and cosmetic industries. This latex, when dried, forms papaya gum, which has diverse industrial applications like -Food Industry, Pharmaceuticals, Cosmetics: film-forming properties. It has Biomedical Applications: Papaya gum is a natural, biodegradable, non-toxic polysaccharide, anti-inflammatory propertiesPapaya gum, also known as papaya resin or latex, is a natural substance derived from the papaya tree (*Carica papaya*). It is obtained by tapping the tree's bark or fruit. The gum is typically a milky, sticky fluid that hardens over time when exposed to air. It has various uses in traditional medicine, sustainable alternative to synthetic polymers. Papaya gum is a versatile natural polymer with a range of applications in food, pharmaceuticals, cosmetics, and biomedical fields., where it is believed to possess anti-inflammatory, antibacterial, and wound-healing properties. In some cultures, papaya gum is applied topically to treat skin conditions, insect bites, or minor cuts. In addition to medicinal uses, papaya gum is sometimes used in the production of chewing gum, adhesives, and varnishes. The latex contains enzymes, including papain, which aids in the digestion of proteins and can be used as a meat tenderizer. However, it is important to note that some individuals may have an allergic reaction to papaya latex. Its unique properties make it a versatile natural resource with both therapeutic and commercial applications.

Keywords: Papaya gum, sustainable synthetic polymer, biodegradable.

HEALTHMEDICON/25/PP-147

**OPTIMIZING SEMAGLUTIDE DOSING FOR EFFECTIVE OBESITY
MANAGEMENT**

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Obesity is basically accumulation of body fat. It is a complex and chronic medical condition. Obesity can affect all ages of individuals, genders and other socioeconomic groups. In current situation it is a very complicated problem due to it leads various types of other problem like Cardiovascular related risk, type 2 diabetes and reduce life expectancy. According to WHO obesity problem has nearly increased triple since 1975. A study indicates that appropriately 18 of men and 21 of women are suffering from obesity related issue. Specially 5 countries US, China, Brazil, Russia and India report for 1/3 of all adults suffering from obesity. Projection indicates that unhealthy diets, physical inactivity, environmental, and hormonal and metabolic factor will raise for patients in future. Proper lifestyle modification and medical treatment can handle this issue. Once weekly Semaglutide at right dose can achieve weight loss. It works by binding to GLP-1 receptors. It helps to regulate blood glucose levels and weight by increasing insulin secretion, slowing gastric emptying and reducing glucagon release.

Keyword: Obesity, Cardiovascular Related Risk, Prevention and Treatment, Semaglutide.

HEALTHMEDICON/25/PP-148

**BIOACTIVE ALKALOIDS AND TERPENOIDS: A NOVEL FRONTIER IN
TREATING NEURODEGENERATIVE DISEASES**

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Bioactive alkaloids and terpenoids have gained significant attention as potential therapeutic agents for neuro-degenerative diseases, owing to their multifaceted biological activities. These natural compounds exhibit neuroprotective, antioxidant and anti-inflammatory properties, addressing the key pathological mechanisms of neuro-degenerative disorders. Alkaloids play a pivotal role in modulating neurotransmitter systems, reducing oxidative stress, and preventing neuronal apoptosis, thereby promoting neural health. Similarly, terpenoids enhance cognitive functions and memory while mitigating neuroinflammation and oxidative damage. Recent research highlights the ability of these compounds to target multiple pathways involved in neurodegeneration, such as amyloid aggregation, mitochondrial dysfunction, and synaptic impairment. Their natural origin and diverse mechanisms of action make them attractive candidates for drug discovery and development. However, challenges like bioavailability, stability and pharmacokinetics must be addressed to optimize their therapeutic efficacy. Advances in analytical techniques and in vitro and in vivo studies have provided insights into their mechanisms of action and potential synergistic effects with existing treatments. Continued exploration of these compounds can pave the way for novel, effective interventions against the growing global burden of neurodegenerative diseases. By integrating traditional knowledge with modern scientific approaches, bioactive alkaloids and terpenoids could offer transformative solutions for these complex disorders.

Keywords: Neuro-degenerative diseases, Neuro-protection, Antioxidant, Anti-inflammatory, Therapeutics.

HEALTHMEDICON/25/PP-149

INFLUENCE OF BINDERS ON DISSOLUTION RATE OF METFORMIN HYDROCHLORIDE TABLETS

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Binders are the polymers that are added to a drug preparation to improve chemical strength and other properties. Common types of binders include hydrophilic binders, naturally occurring binders like gelatin, starch, and cellulose, and synthetic binders like polyvinylpyrrolidone, hydroxypropyl methylcellulose, and polyethylene glycol. A common oral anti-diabetic medication used to treat type II diabetes mellitus is metformin hydrochloride. In IP 2010, metformin hydrochloride and its tablets are recognized as official. Despite the fact that metformin hydrochloride dissolves readily in water, IP 2010 required that metformin tablets undergo a dissolving rate test standard of NLT 70% in 45 minutes. The formulation ingredients or excipients have a significant impact on the rate at which both freely soluble and poorly soluble medications dissolve in tablet dosage forms. The disintegrant and binder are essential components in tablet formulation that affect how quickly medications dissolve. Formulation factors are the cause of the variations in the rate at which various brands of metformin tablets dissolve. The current study's goal is to assess how six widely used binders affect the rate at which metformin pills dissolve and disintegrate. Six binders—acacia, starch paste, poly vinyl pyrrolidine (PVP K30), sucrose, methyl cellulose LV, and hydroxy propyl methylcellulose (HPMC E5LV)—were used in the formulation and preparation of metformin tablets. The tablets were assessed for a number of tablet parameters, such as dissolution rate, to gauge the impact of the binders.

Key words: Metformin hydrochloride, Tablets, Binder, Dissolution rate

HEALTHMEDICON/25/PP-150

TILAPIA FISH SKIN FOR BURN WOUNDS: A NEW APPROACH UNDER STUDY

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Tilapia is a fish that can be cultivated anywhere on the planet. To save the indigenous species from being extinct from natural sources monosex Tilapia are cultured with a different type of fishes. For getting optimum production from the culture system proper food & disease management are essential. Tilapia dermis represents a compelling and feasible alternative for the management of second and third degree burns in affected individuals. Numerous scholarly investigations have indicated that tilapia dermis possesses both antibacterial and anti-angiogenic characteristics that facilitate the healing of wounds while alleviating pain and inflammation in patients suffering from burns. Furthermore, tilapia dermis is abundantly available, cost-effective, and exhibits a minimal risk of disease transmission. In comparison to other

therapeutic modalities, such as cutaneous grafts, tilapia dermis demonstrates a commendable success rate in enhancing wound healing. Although further empirical research is requisite to thoroughly ascertain the efficacy and safety of tilapia dermis in burn treatment, the preliminary findings are encouraging and imply that tilapia dermis may serve as a viable and economically advantageous alternative for burn management.

Keywords: Tilapia, burns, antibacterial, anti-inflammatory, cutaneous grafts

HEALTHMEDICON/25/PP-151

MICRONEEDLE BASED DRUG DELIVERY SYSTEM- CURRENT AND FUTURE PROSPECTIVE

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Microneedle technique have developed as a novel drug delivery system that represents an advanced approach of transdermal administration and effectiveness with patient compliance. This minimally invasive technique consists of arrays of microscopic needles that penetrate the outer layers of the skin and create the microchannel that transports the active ingredients to the targeted site. This review gives the current status of microneedle systems; it shows the designs, methods of fabrication, and application in drug delivery, diagnostics, and vaccination. The applications such as mentioned above have offered great promise primarily for problems facing low bioavailability; first-pass metabolism; and generally, noncompliance of a patient. The advances in the materials used for the purpose of microneedles, such as biodegradable polymers and metals make them safer, more efficient and adaptable. However, several major features, including manufactured scalability, cost-effectiveness, and compliance with very difficult regulatory requirements in the clinical setting, before it might see general adoption. This review also discusses the future prospective of microneedle systems open access to healthcare, particularly in low-resource settings, through simplified vaccine delivery and self-administration models. The next generation of microneedle platforms is expected to be advanced by continued material science, nanotechnology, and device engineering. Exposing the full potential of microneedles and transforming healthcare delivery systems across the globe will depend on interdisciplinary collaboration by overriding the existing challenges.

Keywords: Microneedle technology, Transdermal drug delivery, Biodegradable materials, Vaccine delivery, Patient compliance

HEALTHMEDICON/25/PP-152

DISCUSS ABOUT GOLDEN BLOOD GROUP – FACTORS EVALUATING RH ANTIGEN

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Golden blood group (rh null) can be defined as the rarest type of a blood group, lacking the rh antigen in the Red Blood Cells (RBC). Nearly about less than 50 individuals have this type of blood group. in 1961, it was first discovered in an Australian woman. In India, the first case

was found in Gujarat in 65-year man who had a cardiac attack. Proteins known as Rhesus (Rh) factors or antigens are completely absent in the red blood cells of people with golden blood. It is caused due to the genetic mutations in the RHAG genes (which codes the Rh-associated glycoprotein), which prevents the production of rh proteins that form Rh positive or negative blood groups. A person with this type lacks all the Rh antigens while a person with the Rh-negative blood group lacks only Rh-D antigen. People with the blood type of Rh null may have mild to severe Haemolytic Anemia from birth or have defects in the erythrocyte cells. Though it is a rare type of blood group it can be used as a universal donor with rare or difficult to match blood groups. Because of the rarity of the rare rh phenotype. There are 9 active donors in the world. They are life-threatening as well as lifesaving. Due to the rarity of this phenotype the individuals are encouraged to donate and store their own blood for blood transfusion. To conclude, the rarity poses significant challenges in both clinical and research purposes.

Keywords: rh null, RHAG genes, Rh-D antigen, Anemia, Phenotype

HEALTHMEDICON/25/PP-153

PHARMACOGNOSTIC STANDARDIZATION AND EXTRACTION PROCEDURE GUAVA LEAVES

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The biological source of (*Psidium guajava*) leaves is guava tree, which is native to Central and South America, from the Myrtaceae family, hold medicinal value in traditional healing practices. Accurate identification and quality control are crucial for safe and effective use. This article explores aqueous extraction of guava leaf bioactive for potential health benefits. Two main methods exist for extracting guava leaf components. One is Aqueous Extraction: Targets water-soluble compounds like flavonoids and phenolics. Fresh leaves are washed, shade-dried, and ground into a fine powder. This powder is simmered in hot distilled water for a set time. The solution is filtered, and the filtrate concentrated via evaporation (rotary evaporator) or freeze-drying to obtain the aqueous extract. Another is Solvent Extraction: Employs organic solvents (ethanol, methanol, or a mixture) to extract a broader range of bioactive. A common technique is Soxhlet extraction, where the solvent continuously cycles through the plant material, drawing out the desired compounds. The solvent is then removed from the filtrate using a rotary evaporator under reduced pressure. This work highlights the importance of pharmacognostic standardization and suitable extraction methods to harness the potential of guava leaves for improved public health.

Keywords: Biological source, Myrtaceae family, Pharmacognosical evaluation, Soxhlet extraction, pharmacognostic standardization.

HEALTHMEDICON/25/PP-154

A COMPARATIVE GENOMIC ANALYSIS OF HUMAN METAPNEUMOVIRUS (HMPV) AND SARS-COV-2: IMPLICATIONS FOR PUBLIC HEALTH

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Both Human Metapneumovirus (HMPV) and SARS-CoV-2 are important respiratory viruses that cause public health problems and have a significant impact on global health. HMPV, a member of the Paramyxoviridae family, causes seasonal infections at different times of the year, especially in the young and the elderly. SARS-CoV-2, the unique coronavirus causing the COVID-19 pandemic, has rapidly mutated to form multiple strains with different infection symptoms in order to evade the body's response. The genome structures of HMPV and SARS-CoV-2 show differences in the rate of change and evolutionary history. Public health interventions to reduce the risk of viral infection or to effectively vaccinate populations often have difficulty addressing genotype distribution patterns and the geographic nature of outbreaks. Unlike HMPV, which is relatively stable, the genomic interoperability of SARS-CoV-2 poses a significant problem in public health management and intervention—have also presented challenges in vaccine development. A further line of work could be vaccination research as co-infections with these agents further hamper disease control. Thus, genomic surveillance, as well as the co-development of drugs and vaccines, must continue in a manner that has an all-encompassing approach against dynamic threats posed by these viruses to human beings.

Keywords: Human Metapneumovirus, SARS-CoV-2, Respiratory viruses, Vaccination, Genomic surveillance

HEALTHMEDICON/25/PP-155

OCCUPATIONAL HAZARDS

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Occupational hazards are considered as the threats to the workers that impact the health safety in the professional environments. These risks can be divided into physical, chemical, biological, ergonomic, and psychosocial hazards. Construction mining is characterized by physical hazards: excessive noise, vibration, and extreme temperatures. Chemical hazards are caused by exposure to toxic substances such as organic solvents, pesticides, heavy metals, and lead, and can cause both acute and chronic health problems. Hazards encountered in the environment include infectious agents, healthcare, and agricultural sectors. Risks associated with ergonomics: poorly designed workstations, repetitive tasks leading to musculoskeletal disorders manual labor office jobs Mental health productivity is adversely affected by psychosocial hazards such as workplace stress and harassing long working hours in three ways. Employers should carry out preventive measures tailored to each workplace, such as risk assessments, training, and personal protective equipment. It is critical to develop a local

international standards safety culture so workplace accidents and illnesses significantly. Importance of Workers Health and Safety Attained by such organizations, a summary of government organizations International Labour Organization enforcement regulations ensures proper measures are implemented to protect workers. Protecting employees against workplace hazards not only shows commitment to health and safety but also to overall workplace productivity.

Keywords: Occupational hazards, Excessive noise, Extreme temperature, Mental health

HEALTHMEDICON/25/PP-156

**AN EXTENSIVE ANALYSIS OF DERMACEUTICALS IN COSMETICS MARKET:
REVIEWING THE CONSUMPTION PATTERNS AND STRATEGIES**

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A fast-growing cosmeceutical sector is the outcome of the never-ending quest to prevent aging and preserve a young appearance. Due to claims of efficacy for various skin diseases and symptoms of aging, cosmetic products—especially those of natural origin—are in high demand. Due to its accessibility and lower cost as compared to prescription products, consumers frequently incorporate dermaceutical products into their skin care routine. However, since the U.S. Food and Drug Administration does not oversee cosmeceutical products, many of their constituents lack clinical data addressing their safety and efficacy. Topical cosmetic-pharmaceutical hybrids known as "dermaceuticals" are designed to improve the appearance and health of skin. In recent years, the usage of dermaceuticals has increased significantly. This greatly expands the tools available to therapists to treat skin, hair, and other diseases more effectively. Examining the most recent research on the ideas of drugs, cosmetics, and cosmetics is the goal of this thorough assessment. The evaluation also looks for several gaps in the cosmetics business that pertain to rules and customer behavior. It was formerly believed that cosmetics were only for women, but times are changing, and guys now want to look beautiful because of the fiercely competitive climate. Anti-aging and anti-wrinkle products are among the most widely used skin care items. Now a days the individuals of different ages consume these dermaceuticals in various ways. The study looks for trends in the use of cosmeceutical goods and the tactics used by businesses to remain competitive in this new industry. The future aspects of dermaceuticals includes personalized skincare, biotechnology-driven solutions, eco-friendly formulations, nanotechnology for better delivery, and a focus on the skin microbiome. Preventative skincare, regenerative treatments, AI-based skin analysis, and men's skincare will also gain prominence.

Keywords: Cosmeceutical products, dermaceuticals, customer behavior, anti-aging, nanotechnology.

HEALTHMEDICON/25/PP-157

Organ-on-a-chip: Breakthrough And Challenges

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Organ-on-a-chip (OOAC) has reshaped the medical field by bridging the gap between technology and medicine by providing advancements in drug screening. It refers to a system comprising either engineered or natural small-scale tissues cultivated within microfluidic chips. These chips are specifically designed to replicate human physiology by controlling the cell environments and preserving tissue-specific functionalities. The advantages of OOAC include its small-scale integration, low resource consumption, and precise regulation of factors such as tissue interfaces, concentration gradients, fluid shear stress, and organ interactions. In the early 2000s, researchers aimed to replicate excess fluid accumulation in-vitro, leading to the creation of the first Organ-on-a-Chip model for simulating lung airways. Initially referred to as ‘cells on a chip,’ these microfluidic biological devices evolved over time. Major breakthroughs in research involving OOAC systems have significantly advanced fields like high-throughput drug screening, single-cell research, cellular interactions, neuronal models, and fluid gradient studies such as bacterial chemotaxis, precision medicine, cancer migration, and axon development. However, OOAC technology remains unregulated by major authorities like the U.S. FDA or the European Medicines Agency. By 2020, the global market for OOAC was valued at about USD 41 million, with projections indicating it could reach USD 303.6 million by 2026. Despite its remarkable progress, challenges still persist, such as surface adsorption issues and suboptimal fluid mixing in the microfluidic devices, requiring further refinement.

Keywords: Organ-on-a-chip, Microfluidic chips, Human Physiology mimicry, Drug screening, Cellular Interaction, Precision medicine

HEALTHMEDICON/25/PP-158

NUTRACEUTICALS : THE FUTURE OF PREVENTIVE HEALTHCARE

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Nutraceuticals, derived from dietary and herbal bioactive sources, have emerged as powerful agents in enhancing health, delaying aging, preventing diseases, and improving overall bodily functions. With a global market value of approximately USD 117 billion, their popularity reflects their growing role in modern healthcare. Herbal nutraceuticals, in particular, are recognized for their ability to promote health, longevity, and quality of life through natural and therapeutic properties .This review highlights various bioactive ingredients, including carbohydrates, lipids, edible flowers, alkaloids, and medicinal plants, focusing on their roles in health promotion and disease prevention. Nutraceuticals have shown potential in managing chronic and complex diseases such as cancer, neurodegenerative disorders, cardiovascular diseases, diabetes, and obesity. Their efficacy in addressing oxidative stress-related conditions,

including Alzheimer's disease, Parkinson's disease, inflammation, immune dysfunction, allergies, and eye disorders, is also discussed. By offering a natural, low-toxicity alternative, nutraceuticals complement conventional therapies and provide a holistic approach to treating hard-to-manage conditions. This review explores their mechanisms, therapeutic applications, and potential in personalized medicine, emphasizing their transformative impact on preventive and therapeutic healthcare. Further research is essential to unlock the full potential of nutraceuticals in addressing global health challenges.

Keywords: Nutraceuticals , diseases , herbal , cardiovascular , alkaloid , inflammation , therapeutic healthcare .

HEALTHMEDICON/25/PP-159

INNOVATIVE APPROACHES TO LOW VISION CARE IN MODERN OPTOMETRY

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Low vision, a significant visual impairment with no correction via standard glasses, contact lenses, or surgery, demands advanced medical and technological interventions. Recent innovations in optometry have introduced high-definition optical aids like bioptic telescopes, custom adaptive lenses, and electronic low vision aids (ELVAs). Pharmacological breakthroughs include anti-vascular endothelial growth factor (anti-VEGF) injections for retinal diseases and gene-editing techniques like CRISPR-Cas9 targeting inherited retinal dystrophies. Moreover, stem cell therapy has emerged as a promising avenue for retinal regeneration. Advancements in virtual reality (VR) and augmented reality (AR) systems provide immersive visual training to enhance residual vision. Neuroplasticity-based rehabilitation integrates sensory substitution devices (SSDs) to adapt brain pathways for vision enhancement. Multidisciplinary approaches involving optometrists, ophthalmologists, and biomedical engineers ensure holistic and patient-specific care, revolutionizing low vision treatment. This synthesis of pharmacological, optical, and technological advancements signifies a transformative era in low vision care.

Keywords: Low vision, optometry, treatment innovations, vision care, rehabilitation strategies.

HEALTHMEDICON/25/PP-160

VIRAL INFECTIONS AND PCOS: MECHANISTIC PARALLELS BETWEEN SARS-COV 2 AND HMPV

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Polycystic Ovary Syndrome (PCOS) is a prevalent endocrine disorder characterized by metabolic, reproductive, and inflammatory dysfunctions. Recent studies have highlighted the influence of viral infections, such as SARS-CoV-2, on PCOS progression through mechanisms involving inflammation, hormonal imbalances, and metabolic disruption. Human Metapneumovirus (HMPV), a respiratory virus with structural similarities to SARS-CoV-2,

may similarly impact these pathways. This study investigates the potential role of HMPV in PCOS pathogenesis by analyzing structural parallels between the two viruses, focusing on their spike glycoproteins, receptor interactions, and immune-modulatory mechanisms. These shared features suggest that HMPV, like SARS-CoV-2, could disrupt endocrine signaling, exacerbate insulin resistance, and amplify systemic inflammation, critical factors in PCOS. By drawing on the insights gained from SARS-CoV-2's effects on PCOS, this study proposes a hypothesis linking HMPV to PCOS. It underscores the need for further research into its role in endocrine and metabolic disorders. Understanding these connections could provide new perspectives on viral contributions to PCOS and pave the way for innovative prevention and treatment strategies tailored to individuals with heightened susceptibility to viral infections.

Keywords: Human Metapneumovirus (HMPV), Polycystic Ovary Syndrome (PCOS), Insulin resistance, SARS-CoV-2, Viral endocrinopathy

HEALTHMEDICON/25/PP-161

DEVELOPMENT OF MODIFIED MORINGA GUM-BASED BUCCAL FILM

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Mucoadhesive buccal films are a convenient, non-invasive, and systemic drug delivery system that adheres to the oral mucous membrane, bypassing first-pass metabolism and improving therapeutic outcomes. These films, made from biocompatible polymers like polysaccharides and gums, are eco-friendly, non-toxic, and inexpensive, making them a significant choice for drug delivery. Moringa gum is a natural gum obtained from *Moringa oleifera* (family: Moringaceae). Moringa gum comprises of L-arabinose, L-glucoronic acid, L-galactose and L-rhamnose. The gum has actually been investigated as binder, disintegrant, release retardant for pharmaceutical applications. Thiolation was used to improve the mucoadhesive properties of moringa gum. Thioglycolic acid esterification was used to achieve thiolation. FT-IR, DSC, and XRD analyses were used to analyze thiolated Moringa gum. Methods such as the solvent casting method are used to make buccal films. modified Moringa gum proved to have excellent potential as a mucoadhesive polymer that can be effectively use as a buccal drug delivery systems able to extend the release of the drug, thereby avoiding early hours awakening, improving sleep quality, and enhancing its bioavailability.

Keywords: Mucoadhesive buccal films, Moringa gum, Thiolation, Drug delivery system, Bioavailability

HEALTHMEDICON/25/PP-162

PREPARATION OF CHITOSAN BUCCAL PATCH LOADED WITH HYDROXYAPATITE AND BETANIN FOR PERIODONTAL APPLICATIONS

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Chitosan is reported as a widely used mucoadhesive polymer in drug delivery system for periodontal diseases. Hydroxyapatite is used as it mimics the composition of tooth enamel. It is

reported as a prominent candidate, making it a potential drug delivery system for combating periodontal diseases and post-dental surgical complications. Hydroxyapatite is synthesized from Eggshell and can be used as a remineralizing agent to restore the damaged enamel surface and an effective pulp capping material as well as help in hemostasis process. The loading of natural phytoconstituents like betanin gained promising candidate due to its antioxidant, anti-inflammatory, and anti-microbial properties with minimum toxicity issues. Chitosan-PVA Buccal patch was dual-loaded with Hydroxyapatite and betanin. The patch was prepared by solvent casting method in an aqueous medium. The formulation's structural integrity and ideal drug-polymer interaction were guaranteed by physicochemical evaluation, where the loading of betanin was checked. The concentration of Hydroxyapatite did not show any significant effect on the moisture content of the freshly dried samples. The surface pH of the polymer composites was calculated to be 6.85 ± 0.2 indicating recovery of acidic pH in periodontal inflammatory diseases to near neutral salivary pH. Evaluation of in-vitro release of betanin from the patch showed persistent release over time, providing prolonged therapeutic efficacy. Demonstration of efficient crosslinking of Chitosan-PVA was observed using FTIR. The ex-vivo mucoadhesion time on porcine dermal tissue was about 50 minutes and showed compressive mechanical strength. The prepared dual-loaded Chitosan-PVA Buccal Patch could be one of the promising candidates for periodontal disease treatment.

Keywords: Eggshell, Hydroxyapatite, Betanin, Chitosan, PVA (Polyvinyl alcohol), Periodontal, Buccal Patch, Hemostasis.

HEALTHMEDICON/25/PP-163

ANTIOXIDANT PROPERTIES AND CHEMOPREVENTIVE POTENTIAL OF RAJGIRA (*AMARANTHUS PANICULATUS*) LEAVES IN MICE BEARING EHRLICH ASCITES CARCINOMA: BRIDGING NATURE AND MODERN MEDICINE

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Amaranthus paniculatus, commonly referred to as Rajgira, is extensively acknowledged for its nutritional and therapeutic attributes. This research investigates the antioxidant capabilities and chemopreventive effectiveness of its leaf extract in addressing cancer-associated oxidative stress. Abundant in bioactive constituents such as flavonoids, phenolics, and tannins, Rajgira leaves demonstrate significant free radical scavenging abilities, thereby enhancing the antioxidant defense mechanisms and mitigating oxidative injury. Utilizing Ehrlich's Ascites Carcinoma (EAC) model, the leaf extract exhibited its capacity to suppress tumor proliferation and enhance survival rates. Furthermore, it reinstated hematological parameters altered by neoplastic conditions, thereby supporting its function in sustaining physiological equilibrium amid oxidative stress. The bioactive components of the extract are posited to facilitate these outcomes through the modulation of cellular antioxidant enzymes and the attenuation of lipid peroxidation, emphasizing its potential to alleviate oxidative stress-induced harm. These results highlight the therapeutic potential of *Amaranthus paniculatus* as a natural antioxidant and chemopreventive substance. Its prospective applications encompass the formulation of plant-derived strategies for the management of oxidative stress and the improvement of cancer treatment methodologies.

Keywords: *Amaranthus paniculatus*, antioxidant, cancer prevention, oxidative stress, Ehrlich's Ascites Carcinoma.

HEALTHMEDICON/25/PP-164

HERBAL MEDICINES AS INFALLIBLE REMEDY

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Traditional use of Herbal medicines implies substantial historical use, and this is certainly true for many products that are available as 'Traditional Herbal Medicines'. It has preserved the health of primarily Asian people for thousands of years with a distinct medical system based on empirical and accumulated knowledge, Traditional Herbal Medicine, also known as Alternative Herbal Medicine, has been a vital source of primary healthcare for many people worldwide. According to AYDIN, billions of people worldwide currently take traditional herbal medicine on a daily basis in the form of food, medications, or supplements. Traditional herbal medicine have been reported to have been used to cure or prevent many diseases and element including Gastroesophageal reflux disease, prevents postoperative recurrence of small hepatocellular carcinoma, adjuvant for chemo- and radiotherapy for cancer , adjunctive therapy for naso-pharyngeal cancer, resectable gastric cancer , treatment of viral infections, stress and anxiety as well as improve mental health during, from general body pain to complex diseases, depends heavily on sustainable management of traditional herbal medicine, reactions, and difficulties in the monitoring and safety of plant resources. Although the knowledge gained from their long history of traditional use should not be disregarded, the majority of herbal medicines still require scientific investigation. Due to the lack of sufficient evidence generated by standard scientific methods to address concerns regarding the safety and effectiveness of the majority of currently used herbal medications.

Keywords: Indigenous Remedies, Traditional Herbal Medicines, Naso-pharyngeal Cancer, Live to lise, Phytomedicine.

HEALTHMEDICON/25/PP-165

STUDIES ON THE ANTIOXIDANT, ANTI-INFLAMMATORY AND CYTOTOXIC ACTIVITY OF *COSTUS IGNEUS* FLOWER EXTRACT

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The herbaceous plant species *Costus igneus* is often referred to as spiral flag or flaming costus. Also known as the insulin plant, it is said that it assists in the body's production of insulin. However, no research has been done to assess the pharmacological properties of the flower component of *Costus igneus*, such as its anti-inflammatory and antioxidant properties, or to ascertain its toxicity profile. Use protein denaturation activity or hypotonicity-induced human red blood cell (HRBC) membrane stabilization techniques to examine anti-inflammatory qualities. Assays for DPPH, superoxide, and reducing power will be used to measure antioxidant activity. In order to assess the toxicity that the flower pod of *Costus igneus* causes

to brain shrimp during their developing stage, cytotoxicity research will be conducted. This will guarantee that the substance has a negative impact on fertility, and birth abnormalities may arise at any point during the reproductive cycle. Based on research, the flower of *Costus igneus* may offer anti-inflammatory and antioxidant properties with a low cytotoxic profile. In order to promote their application in medication development, future research will concentrate on identifying and characterizing the bioactive chemicals that cause these behaviours. Consequently, this plant has anti-inflammatory and anti-oxidant qualities in addition to being used as a medication to treat diabetes.

Keywords: *Costus igneus*, Anti-inflammatory, Antioxidant, Cytotoxicity, Diabetes

HEALTHMEDICON/25/PP-166

UNRAVELLING THE POTENTIAL: PHYSIOLOGICAL ACTIONS OF CARBOMER POLYMER DERIVED FROM BANANA PSEUDOSTEM

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The physiological effects of a novel carbomer polymer extracted from the banana pseudostem, an abundant source of polysaccharides, have been studied in this work. The synthesized polymer was characterized and tested for antioxidant, anti-inflammatory, and antimicrobial activities. Our results clearly show that the carbomer polymer possesses significant biological activities, which include scavenging free radicals, inhibition of inflammatory mediators, and potent antimicrobial effects against a range of pathogens. In addition, the polymer was found to modulate key physiological pathways, including the regulation of blood glucose and lipid profiles, as well as exhibiting protective effects against oxidative stress and inflammation. The carbomer polymer also showed excellent biocompatibility and non-toxicity, making it a promising biomaterial for various biomedical applications. This study unlocks the potential of banana pseudostem-derived carbomer polymer with therapeutic potential to prevent and treat various diseases such as diabetes, cardiovascular disorders, and infectious diseases.

Keywords: Banana pseudostem, Carbomer polymer, Physiological activities, Antioxidant, Anti-inflammatory, Antimicrobial.

HEALTHMEDICON/25/PP-167

IN DEPTH STUDY ABOUT CHROMOSOMAL NON-DISJUNCTION IN BRIEF DISCUSSION

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Chromosomal non-disjunction is a pivotal error in cell division where chromosome fail to separate properly during meiosis or mitosis, resulting in an abnormal number of chromosomes, the condition is known as aneuploidy. This phenomenon has significant consequences for

human health, as it underpins several kinds of genetic disease, such as Down syndrome, Turner syndrome and Klinefelter syndrome. Non-disjunction may occur during mitosis, Meiosis-I or meiosis-II and various factors influence how sister chromatids or homologous chromosomes segregate. Maternal age is a significant risk factor, spicily for neostick non-disjunction triggered by prolonged oocyte stoppage in Prophase-I. Additional causes environmental and genetic and epigenetic alterations in cohesin proteins. Non-disjunction can cause developmental issues, miscarriages, mosaicism and chromosomal instability in cancer. The diagnosis of aneuploidy has increased due to advances in diagnostic procedure such as Karyotyping, Fluorescence in situ hybridization (FISH) and non-invasive prenatal testing. Preimplantation genetic testing (PGT) and genetic counselling provide at risk families with preventive measures. Despite advancement in understanding the molecular causes and effects treatment options remains limited. Continued study is needed to understand the complexity of non-disjunction and to determine appropriate treatment. The present research emphasizes on the molecular principles, causal variables and clinical effects of chromosomal non-disjunction forcing on its significant in medical genetics and reproduction. Improved awareness and diagnostic capabilities will improve patient care while providing in-sighting into the future preventive and therapeutic treatments.

Keywords: Non-disjunction, Fluorescence in situ hybridization, Preimplantation genetic testing, Down syndrome, Turner syndrome.

HEALTHMEDICON/25/PP-168

LEADLESS PACEMAKERS: A REVOLUTION IN CARDIAC PACING TECHNOLOGY

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A pacemaker is a type of cardiac implantable electronic devices (known as CIED) in cardiology which help to control irregular heart rhythm by delivering the electrical impulses in the heart through electrodes which contract the heart muscle. The primary purpose of this device is to maintain an adequate heart rate, either because the heart's natural PM is not fast enough, or there is a block in the heart's electrical conduction system. Significant inception of advancement in implantable cardiac pacemaker were started over sixty years ago, which undergone remarkable progress, have remained a corner stone therapy for symptomatic bradycardia. Despite all the advancements, the basic design of pacemaker remained unchanged, and this system still require surgically created pocket for the generator, vascular system lead as well as a passage through the valve. During implant and explant, most complications caused by surgical pocket and indwelling leads. Therefore, to overcome the complications, there is strong interest in a system which offers the benefits of cardiac pacemakers while reducing the risks associated with transvenous leads. Leadless cardiac pacing emerged as an alternative in the future of cardiac pacing that promises to eliminate lead and pocket related complications. As an upcoming technology, some questions related to longevity and life management of cardiac pacemaker remain unsolved. This review summarizes the available technology, implant and explant details, and long-term safety and efficacy data for leadless pacemakers.

Keywords: Pacemaker, LCP, TCP, Primary Cohort, Asystolic pause.

HEALTHMEDICON/25/PP-169

NOVEL ANTIVIRAL STRATEGIES TARGETING HMPV FROM BENCH TO BEDSIDE

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Human Metapneumovirus (HMPV) is a major cause of respiratory infections, especially in high-risk populations. Although it has a significant global burden, no vaccines or specific antivirals are approved to date. This review covers new antiviral approaches targeting HMPV, including inhibitors of viral entry (fusion protein inhibitors and neutralizing antibodies), viral replication (RNA polymerase inhibitors and siRNAs), and host-directed therapies (immune modulators and cellular entry inhibitors). It also introduces the reader to the newer forms of drug delivery systems, which include nanoparticles, liposomes, and light-activated therapies. The future horizon includes broad-spectrum inhibitors, orally bioavailable drugs, and inhalable nanoparticle formulations. Difficulties arising from drug resistance, delivery, and host toxicity are discussed in relation to their possible solutions like combination therapies and prodrugs. Finally, these innovative approaches may be the hope for efficient HMPV therapies in the clinical setting. The collaboration between research and clinical sectors is important in translating these promising approaches from the lab to patient care.

Keywords: HMPV, Respiratory infections, Vaccination, Nanoparticles, Neutralizing antibodies, Clinical sectors

HEALTHMEDICON/25/PP-170

A DEEP DRIVE IN MODERN APPROACH IN THE TREATMENT OF INFERTILITY IN MALE AND FEMALE BY THE COURTESY OF STEM CELL THERAPY

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Infertility is a medical condition where people having frequent coitus in unprotected manner but yet unable to conceive after one year. Stem cell therapy has become a remarkable treatment which is a major choice for male and female infertility, providing hope to people who are having trouble getting pregnant because of a number of underlying medical problems. About 15% of people worldwide experience infertility, which can be linked to structural, hormonal, genetic, or biological factors. In extreme circumstances, traditional therapies including hormone therapy, assisted reproductive technologies (ART), and surgery frequently have only patchy results. Utilizing stem cells capacity for regeneration, stem cell therapy offers a novel substitute. Male infertility may result from testicular damage, Sertoli cell-only syndrome, or non-obstructive azoospermia. Spermatogonial stem cells and “mesenchymal stem cells, that have shown potential in repairing injured testicular tissue, restoring spermatogenesis, and differentiating into germ cells. It has been demonstrated that stem cells, such as bone marrow-derived stem cells (BMDSCs) and ovarian stem cells (OSCs), can enhance endometrial receptivity, stimulate folliculogenesis, and regenerate ovarian tissue. SSC-based treatments have improved sperm production in animal models, while MSC transplantation has been associated with enhanced ovarian reserve and endometrial healing. Stem cell therapy has

revolutionary potential for treating infertility by the courtesy of developments in stem cell research and improved knowledge of reproductive biology. Further investigation and clinical verification are essential for streamlining procedures, guaranteeing security, and integrating this novel strategy into standard therapeutic practice for infertile patients.

Keywords: Stem cells, Infertility, Germline stem cells, Mesenchymal stem cells, Spermatogonial stem cells

HEALTHMEDICON/25/PP-171

SMART AND PORTABLE IOT-BASED SYSTEM FOR MEDICATION ADMINISTRATION AND REMOTE PATIENT MONITORING

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In recent times, advancements in healthcare technology have been significantly influenced by the Internet of Things (IoT). The integration of ubiquitous computing has brought transformative changes to the healthcare sector. Healthcare professionals are now able to serve society more effectively by utilizing IoT-enabled devices. This paper introduces a model called the "Smart Portable Intensive Care Unit," designed for real-time patient monitoring and remote drug delivery. The proposed system assists healthcare providers and patients' relatives by enabling remote monitoring of physiological data. Patient data is transmitted to the cloud and can be accessed via a custom-developed Android mobile application. This application retrieves real-time data from the cloud database while ensuring user authentication throughout the communication process. The physiological information is displayed on the doctor's mobile application in both digital and analog formats, allowing seamless interpretation. Furthermore, doctors can remotely adjust the rate of drug infusion. This model is particularly beneficial for patients in hospital settings or during ambulance transport, providing continuous monitoring and timely intervention.

Keywords: IOT, Smart Portable Intensive Care Unit, cloud database, remote drug delivery

HEALTHMEDICON/25/PP-172

Advances In Transdarmal Insulin Delivery

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Insulin therapy is essential to control blood glucose levels for person with type 1 diabetes and significantly used in advanced type 2 diabetes. Though subcutaneous insulin administration through injection or pump mediated imposition is best route of insulin delivery, but it may be causes pain, needle phobia, and reduce adherence, as well as the risk of infection. Hence, transdermal insulin delivery has been broadly investigating as a fascinating alternative to subcutaneous approaches for diabetes management in recent years. Transdermal systems are

intended to protect from insulin degradation and offer controlled, sustained release of insulin may lead to improved patient compliance and adherence. A challenge for transdermal passive insulin absorption through the skin is impeded by the sizeable molecular structure of insulin, leading to inefficient delivery molecular weight of the protein drug. This review provides an overview of various transdermal insulin delivery methods, highlighting their benefits, drawbacks, and chemicals enhancements. enhancer promoted, electrically enhanced, mechanical force-triggered, and microneedle-assisted methods.

Keywords: Diabetes, Drug Delivery, Jet injection, Microneedle, Transdermal delivery, Insulin.

HEALTHMEDICON/25/PP-173

FORMULATION AND CHARACTERIZATION OF VALSARTAN FLOATING TABLETS USING NATURAL POLYMERS (HIBISCUS LEAF MUCILAGE AND OKRA GUM) WITH CO-CRYSTALLIZATION TECHNIQUES FOR PULSATILE DRUG DELIVERY IN HEART DISEASE MANAGEMENT USING DOE SOFTWARE

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Pulsatile Drug Release System (PDDS) is defined as a rapid and transient release of a certain quantity of drug molecules within a short period immediately after a predetermined switching-off release period. PDDS have increasing choices as they deliver the drug at the right amount, at the right time, and at the right area or location. Thus, PDDS ensures spatial and chrono-pharmacological delivery by a complete compliance to the patient. The system is diagrammed as per the circadian rhythm of the body. In circadian rhythms of the sleep-wake pattern (24 hours), that is induced by light and dark and the other factors influencing the chrono-pharmacology that aids in the regulation of the daytime cycle of sleep and wakefulness, formulation of macro-physics PDDS could be termed as a single unit and multiple unit systems. In a single-unit system, there will be just one of these types of capsules: osmosis, erodible, barrier, or rupturable coating. Many systems have been designed with one of the membrane permeability, rupturable coating, or osmotic-based rupturable coating systems, as described in the literature. Valsartan is the BCS-Type-II drug suggested for Hypertension. Valsartan is a low-soluble and highly permeable pharmacophore molecule. Co-crystallization of Valsartan helps to stretch the solubility of the moiety. We have used the QBD technique with the help of DOE software to formulate by Factorial-Design of the optimum-Formulation of a Fast-Dissolving Tablet. Sodium Starch Glycolate (SSG), Cross Carmilose Sodium (CCS) as super disintegrants; and Hibiscus Leaf's Mucilage as a coating creditor to develop the PDDS. To cast an ever-demanding New Drug Delivery System; PDDS is one such novel plethora of formulations. Concluding, PDDS is the right choice for maximum patent compliance with minimal untoward effects.

Keywords: Pulsatile Drug Release System, Circadian Rhythm, Chrono-pharmacology, Valsartan, Fast Dissolving Tablet

HEALTHMEDICON/25/PP-174

NANOTECHNOLOGICAL INTERVENTION IN HEPATOCELLULAR CARCINOMA: ADVANCING THERANOSTIC APPROCHES

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Liver, the second-largest and vital organ of the body, is highly susceptible to diseases such as hepatitis B virus infection, liver cirrhosis, and hepatocellular carcinoma (HCC), which pose significant global health challenges due to limited therapeutic options. Currently, liver resection and transplantation are the primary treatment modalities for advanced liver diseases. Hepatocellular carcinoma, the third leading cause of cancer-related deaths worldwide and the sixth most common cancer, is often diagnosed at an advanced stage, contributing to its poor prognosis. In recent years, the use of nanoparticulate systems in cancer medicine has revolutionized drug delivery by improving bioavailability, solubility, in-vivo stability, and therapeutic efficacy. These systems have gained considerable attention in HCC therapeutics, offering enhanced drug delivery, targeted therapy, and real-time monitoring, leading to more promising anti-cancer outcomes. Nanotechnology facilitates the development of various nanoparticle-based drug delivery systems that can specifically target HCC cells, improving treatment precision. This presentation would explore the role of nanoparticulate drug delivery carriers in the diagnosis and treatment of HCC, emphasizing their potential to address current challenges and improve patient outcomes.

Keywords: Nanotechnology, Nanoparticles, Hepatocellular Carcinoma (HCC), Tumour cells, target therapy

HEALTHMEDICON/25/PP-175

A COMPLETE REVIEW UPON MODERN HIGHLIGHTS ON HIV DNA INTEGRATION

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Living cells are complex organisms sharing simple tasks across a variety of levels to get their desired nutrition. HIV - 1 is no exception to this, it too requires to perform a number of events to aid the propagation. Unlike conventional methods of proliferation, HIV - 1 had involved tricky ways for their survival. Following this paradigm, beginning with anchoring, uncoating, reverse transcription, integration, synthesis of genetic compounds release. Having done that the HIV - 1 retroviruses cause a spike in the infectious state and show a surge in the clinical outcomes. Therefore, integration has been found to build the turf of HIV - 1 inside the host cell network. Two steps - (a) 3' end processing & (b) DNA strand transfer are gone through for the

feasible accomplishment of integration. In this several host cells, structural, chromatin cell proteins take part. Overall, these factors, only harmful proteins like Integrase (IN), RNase H have their eminent participation. Other functionally efficient proteins (LEDGF/p75, EED, Ini - 1) pledge their effort in the integration. Being a seemingly crucial phase in the HIV - 1 life cycle integrase has been our area of integrase in this whole review. The entire information is provided against legitimate literature. To tell briefly, HIV - 1 progresses to form its reserve transcribed DNA with the host DNA following the integration mechanism.

Keywords: HIV-1, Retrovirus, Integration, Integrase (IN)

HEALTHMEDICON/25/PP-176

**NUTRACEUTICAL AND FUNCTIONAL FOODS FOR THE FUTURE:
COMBATTING LIFESTYLE DISEASES**

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Lifestyle diseases, including obesity, diabetes, cardiovascular disorders (CVDS), and metabolic syndromes (Insulin resistance syndrome), Significant global health concerns due to changing dietary habits, sedentary lifestyles, and increased life expectancy. Bioactive compounds and fortified foods in mitigating the risks of lifestyle diseases. Highlight their mechanisms of action, including antioxidant, anti-inflammatory (NAIDs), and metabolic regulatory properties, while examining their role in personalized nutrition and chronic disease management (CCM). Additionally, the manuscript discusses current advancements, regulatory challenges, and the future outlook of integrating nutraceuticals and functional foods into mainstream healthcare practices to promote healthier living and combat the growing burden of lifestyle diseases.

Keywords: Lifestyle diseases, Obesity, Diabetes, Cardiovascular disorder, Nutraceuticals, Nutritional Sciences, Regulatory Challenges.

HEALTHMEDICON/25/PP-177

CHEMOTHERAPY INDUCED PERIPHERAL NEUROPATHY: A MOLECULAR PERSPECTIVE

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A frequent side effect of several chemotherapeutic drugs, such as cisplatin, oxaliplatin, paclitaxel, vincristine, and bortezomib, is chemotherapy-induced peripheral neuropathy (CIPN). Patients with CIPN experience sensory disturbances as a result of the loss of sensory nerve fibres. It impacts the efficiency and patient survival of chemotherapy by affecting 19–85% of patients and frequently requiring dose reduction or early treatment termination. Chemotherapeutic agents interfere with microtubule stability, which disrupts axonal transport and neuronal cytoskeletal structure. Exposure to these substances results in mitochondrial swelling and dysfunction, which leads to nerve fibre degeneration because of the peripheral nervous system's weak blood-nerve barrier. Neuronal agitation and pain transmission are

enhanced when dorsal root ganglion neurones express more ion channels. Moreover, CIPN is exacerbated by neuroinflammation brought on by cytokine production and immune cell infiltration. Central sensitisation is caused by alterations in the central nervous system, such as neuronal hyperactivity in the anterior cingulate cortex and spinal dorsal horn. There is growing evidence that the development of CIPN is linked to dysbiosis of the gut microbiota. With the goal of reducing CIPN and enhancing the quality of life for cancer patients, advances in RNA-sequencing present new avenues for drug discovery and repurposing.

Keywords: Chemotherapy-induced peripheral neuropathy (CIPN), Cisplatin, Neuronal excitability, Mitochondrial dysfunction, Dorsal root ganglion neurons, Nerve fiber degeneration, Gut microbiota dysbiosis.

HEALTHMEDICON/25/PP-178

BEHAVIOURAL AND NEUROCHEMICAL EVALUATION OF PERMENT® AN HERBAL FORMULATION IN CHRONIC UNPREDICTABLE MILD STRESS-INDUCED DEPRESSIVE MODEL

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Depression is a complex disorder frequently linked to modifications in behaviour and neurochemical processes. This research examines the prospective antidepressant properties of Perment®, a polyherbal formulation, within a rodent model of chronic unpredictable mild stress (CUMS)-induced depression. Rodents exposed to 21 days of CUMS displayed depressive-like behaviours, characterized by diminished sucrose preference (anhedonia), heightened immobility in the forced swim test (despair), and reduced exploratory behaviour in the open field test (apathy). Administration of Perment® significantly ameliorated these behavioural impairments, indicating enhancements in mood and motivation. Neurochemical evaluations indicated that Perment® reinstated levels of monoamine neurotransmitters, including serotonin and dopamine, in critical brain areas and alleviated oxidative stress by restoring lipid peroxidation and superoxide dismutase levels to baseline. Furthermore, Perment® decreased elevated corticosterone levels, underscoring its potential function in modulating the hypothalamic-pituitary-adrenal (HPA) axis. These results imply that Perment® produces antidepressant-like effects through both behavioural and neurochemical adjustments, advocating for its application as an adjunctive treatment for stress-related depression.

Keywords: Perment®, Chronic Unpredictable Mild Stress (CUMS), Depression, Monoamine neurotransmitter, Oxidative stress

HEALTHMEDICON/25/PP-179

**FORMULATION AND CHARACTERIZATION OF CARVEDILOL TIME
DEPENDENT (PULSATILE) PRESS COATED TABLET DOSAGE FORM
CORRESPONDING TO CHRONOBIOLOGY**

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Pulsatile drug delivery system (PDDS) is beneficial for managing diseases with symptoms following circadian rhythms like rheumatoid arthritis, asthma, hypertension etc. They synchronize drug release with disease patterns providing targeted, timely treatment and fewer side effects. Press-coated tablets are crucial for precise pulsatile drug release, using specific polymers like HPMC and Ethyl-cellulose (EC). These tablets can be tailored to target therapeutic windows, enhancing chronotherapy for conditions with circadian rhythms. The versatility of these polymers makes press-coated tablets an effective solution for time-sensitive therapies. Carvedilol matrix tablets were formulated using HPMC K100 and EC and their drug release profiles were evaluated through dissolution testing. The Korsmeyer-Peppas model was applied to analyse release kinetics, while DD-Solver was used to calculate Akaike Information Criterion (AIC) and Model Selection Criterion (MSC) values to assess the fit of the release models. Additionally, Post-Hoc Tukey-HSD analysis was conducted to compare the release patterns of formulations F2, F5, F9, providing a comprehensive evaluation of their dissolution profiles. The Korsmeyer-Peppas model is fit by the formulas designated F5 and F9 ($R^2 > 0.99$). With a 6-hour delay and a 24% drug release, F5 showed the best pulsatile release. F9, on the other hand, achieved 80% while F2 released 45–50%. HPMC K100 increased release rates, whereas EC slowed release by creating a gel layer. Investigation objective was to create and assess carvedilol pulsatile-release matrix tablets utilizing HPMC K100 and EC to evaluate lag-time patterns and release profiles. Formulation F5 demonstrated superior pulsatile release capability and providing a controlled release pattern.

Keywords: Pulsatile drug delivery, Press-Coated, HPMC K100, Ethyl-Cellulose, Korsmeyer-Peppas model.

HEALTHMEDICON/25/PP-180

SACCHAROMYCES CEREVISIAE AS A MODEL FOR DEVELOPING ANTI-PRION STRATEGIES

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Prion diseases are fatal, incurable neurodegenerative disorders affecting humans and other mammals. These diseases are induced by cellular prion protein (PrP^c) misfolding into the neurotoxic, self-propagating PrP^{Sc} conformer. CJD, a rare and transmissible neurodegenerative condition, is the most common human prion disease. Epigenetic processes contribute to its advancement, including DNA methylation, histone changes, and microRNA-mediated post-transcriptional control. Currently, no proven cure for CJD exists, although clinical trials at the National Prion Clinic (NPC) investigate potential treatments. However,

therapeutic development is limited by a lack of understanding of drug targets, and most approaches focus on symptomatic relief. A promising shift in research involves reducing PrP^c expression as a principal therapeutic strategy. Antisense oligonucleotides (ASOs) have shown potential in reducing target mRNA levels in the brain, extending the lifespan of prion-infected individuals, as demonstrated *in vivo*. Additionally, anti-prion systems have been successfully developed in the model organism *Saccharomyces cerevisiae*. These systems effectively combat prions by preventing their formation, curing existing prions, blocking infections, and mitigating prion-induced cytotoxicity while maintaining normal cellular functions. As these systems have primarily been studied in yeast, future research should explore similar strategies in other microorganisms to establish novel therapeutic avenues. Expanding this line of investigation may provide innovative and effective treatments for prion diseases.

Keywords: Prion Disease, Creutzfeldt-Jakob Disease (CJD), Anti-Prion System, *Saccharomyces cerevisiae*, Novel Therapeutic Strategies

HEALTHMEDICON/25/PP-181

EFFECT OF POLYMER ON RELEASE PATTERN IN ACCORDANCE WITH TRANSDERMAL FORMULATION: A SYSTEMIC REVIEW

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Transdermal drug delivery systems (TDDS) offer a non-invasive route for drug administration, ensuring sustained release and improved patient compliance. Polymers play a crucial role in the formulation of transdermal patches by controlling the release of the active pharmaceutical ingredient (API) through the skin. These polymers can be classified into two categories: permeation enhancers and matrix-forming agents. Permeation enhancers facilitate the penetration of the drug across the skin's stratum corneum by temporarily disrupting its lipid barrier, while matrix-forming polymers control the rate of drug release by forming a stable matrix or reservoir for the drug. The selection of the right polymer is vital to optimize drug release kinetics and maintain therapeutic efficacy. Polymers such as *polyvinyl alcohol*, *ethyl-cellulose*, and *Polyethylene glycol* are commonly used in transdermal patch formulations, owing to their biocompatibility, ability to form cohesive films, and control over drug release. The rate of drug diffusion through the skin can be modulated by adjusting the polymer's molecular weight, structure, and interaction with the drug. Furthermore, the inclusion of adhesive polymers ensures proper adhesion of the patch to the skin, ensuring consistent drug delivery over an extended period. Advances in polymer science continue to improve the performance and versatility of transdermal patches, making them a promising approach for the delivery of both small molecules and biologics. This paper reviews the role of various polymers in transdermal drug delivery, highlighting their impact on drug release profiles, skin permeation, and overall patch performance.

Keywords: Non-invasive route, Transdermal, Permeation, Drug release, Polymers.

HEALTHMEDICON/25/PP-182

WOMEN AND RHEUMATOID ARTHRITIS: CHALLENGES, COMORBIDITIES, AND TREATMENT HORIZONS

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Rheumatoid Arthritis (RA) is a chronic systemic inflammatory illness that primarily affects diarthrodial joints, causing disability, societal burden, and diminished productivity. In women, the most common form of arthritis is inflammatory arthritis. RA produces inflammation, joint degradation, and bone erosion due to mast cells, monocytes, dendritic cells, and adaptive immune cells such as B, Th1, Th17, and plasma cells. Rheumatoid factor, C-reactive protein, anti-cyclic citrullinated peptide antibodies, and erythrocyte sedimentation rate identify RA. Early detection is crucial for effective disease management. Comorbidities associated with RA include Sjögren's syndrome, scleritis, pleural effusion, and cardiovascular complications, further exacerbating the disease burden. Advancements in treatment have led to the development of disease-modifying antirheumatic drugs and targeted biologics, such as TNF inhibitors, IL-6 inhibitors, and CD20 inhibitors, which aim to modulate immune pathways and halt disease progression. Emerging cellular targets, including IL-17 and CD80 inhibitors, show promise in achieving sustained remission. Despite progress in therapy, challenges such as side effects, frequent dosing, and infection risks persist. This work emphasizes the importance of early diagnosis, personalized treatment strategies, and continued research into novel therapeutic targets to improve outcomes for RA patients, particularly women.

Keywords Rheumatoid Arthritis, Immune Cell Infiltration, Disease-Modifying Antirheumatic Drugs, Early Diagnosis, Comorbidities in RA, Novel Therapeutic Targets

HEALTHMEDICON/25/PP-183

RECENT DEVELOPMENTS IN ACCORDANCE WITH POLYMER CATEGORY AND DEVICE TECHNOLOGY CONCERNING THERAPEUTIC SUPPORT IN OCULAR DRUG DELIVERY

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Ocular drug delivery systems (ODDS) are pivotal in the treatment of a variety of eye diseases, ranging from ocular infections to chronic conditions such as glaucoma, macular degeneration, and diabetic retinopathy. The human eye, with its complex anatomy and physiological barriers, presents significant challenges for effective drug delivery. These challenges include the blood-retinal barrier, *the corneal epithelium*, and the limited bioavailability of drugs when administered through conventional routes. But recent advancements in ocular drug delivery systems have focused on enhancing the bioavailability, prolonged drug release, and targeting the specific ocular tissues. Innovations in drug delivery technologies, such as ocular inserts, biodegradable films, and microneedle arrays, have shown promising results in improving therapeutic outcomes while minimizing systemic side effects. The improvement of bioavailability can be achieved with the employment of polymers. This review provides an overview of the recent developments in ocular drug delivery systems, highlighting the

categories of polymer used, application devices, and potential benefits of each approach. The future of ODDS lies in the integration of advanced biomaterials, targeted drug release strategies, and personalized medicine to offer safer, more effective treatments for ocular diseases.

Keywords: Ocular delivery, bioavailability, prolonged release, ocular inserts, microneedle arrays.

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A CRITICAL REVIEW OF TRANSDERMAL DRUG DELIVERY SYSTEM IN ACCORDANCE WITH POLYMER CATEGORY

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In accordance with including low solubility and quick degradation, transdermal drug delivery systems (TDDS), are becoming a sophisticated approaches to effective drug absorption. By providing focused and regulated medication release, these devices improve treatment results and reduce adverse effects. Transdermal patches offer non-invasive delivery, enhanced patient compliance, and circumvention of first-pass metabolism in contrast to conventional oral and parenteral forms. Drug absorption is largely inhibited by the structure of the skin, especially the stratum corneum, whereas systemic absorption is facilitated by the dermis through microcirculation. A variety of patch types are made for continuous release, such as drug-in-adhesive systems, reservoir, and matrix. These patches may be designed to produce the required release profiles by using certain polymers, such as hydrophilic or hydrophobic types. Transdermal patches provide sustained, controlled release, making them especially useful for medications with short biological half-lives or narrow therapeutic indices. Polymers, membranes, medications, excipients, and penetration enhancers are important components in the formulation of TDDS. Drug diffusion is controlled by polymers, while release rates are controlled by membranes. Drug adherence and penetration are improved by pressure-sensitive adhesives and penetration enhancers, respectively. Excipients enhance mechanical characteristics and permeability, while backing membranes provide flexibility. This systematic review analyses a five-year study (2020–2025) on the types of medication, polymers, and polymer categories used in (TDDS). It evaluates their impact on successful and regulated medication administration, highlighting TDDS as a viable non-invasive option for managing various medical conditions.

Keyword: TDDS, penetration, drug absorption, membrane, polymers.

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CRISPR-CAS SYSTEMS: REDEFINING GENETIC MANIPULATION IN MICROBIAL RESEARCH

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CRISPR-Cas systems have transmuted genetic engineering, offering exact and efficient tools for editing microbial genomes. Primarily identified as a prokaryotic immune mechanism

against foreign genetic elements, these systems have since been adapted for progressive genetic manipulation. The programmability of CRISPR-Cas technology has allowed significant progress in microbial research, including gene function studies, metabolic engineering, and the expansion of microbial cell factories for sustainable biofuel, pharmaceutical, and chemical production. Additionally, CRISPR-based strategies are tiling the way for groundbreaking antimicrobial solutions by targeting specific pathogenic bacteria, addressing the growing challenge of antibiotic resistance. CRISPR has simplified the creation of complex gene circuits and microbial biosensors in synthetic biology. Despite its groundbreaking applications, limitations such as off-target effects and efficient delivery methods remain critical for enhancement. This review examines the evolving role of CRISPR-Cas systems in microbiology, prominent current innovations, and exploring future potential in biotechnology and therapeutic development.

Keywords: CRISPR-Cas systems, genetic manipulation, biofuel production, gene circuits, gene editing, off-target effects, microbial biosensors, antibiotic resistance, synthetic biology

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Insitu-gel of ocular Drug Delivery

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Ocular drug delivery systems offer targeted therapy with condensed systemic side effects and enhanced bioavailability, endorsing better patient compliance through non-invasive methods. Nevertheless, their efficacy is delayed by challenges such as poor corneal penetration and rapid tear turnover. To address these issues, advanced dosage forms like in-situ gels, ocular films, and nanoparticulate systems have been developed for sustained drug release. In-situ gels, which changeover from liquid to gel upon exposure to biological conditions, are particularly promising. They can be triggered by pH changes, temperature shifts, or ionic interactions, with Poloxamer 407 commonly used for its thermoreversible properties. Carbopol 940 and Hydroxypropyl methylcellulose (HPMC) are also employed for viscosity enhancement and gelation. Recent advancements in ionic gelation and solvent evaporation techniques have improved nanocarrier formulations, including nanoparticles and nanoemulsions. Polymers like chitosan, hyaluronic acid, and alginate offer enhanced mucoadhesion, biocompatibility, and sustained release, meaningfully improving drug retention and therapeutic outcomes in ocular treatments.

Keywords: Insitu gel, Novel ocular drug delivery system, pH-triggered insitu system, Ion-activated insitu system, Temperature evident insitu system, Sol to gel

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Blockchain technology in healthcare: securing electronic health records

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The use of blockchain technology in healthcare has great potential for protecting Electronic Health Records (EHRs) and improving overall patient data management. EHRs are essential for providing high-quality healthcare, yet they are frequently subject to illegal access, data breaches, and cyberattacks. The decentralized, unchangeable ledger technology known as blockchain provides a strong answer to these problems. Healthcare providers can promote data integrity and patient privacy by using blockchain technology to make sure that patient records are tamper-proof, auditable, and encrypted. Every change made to a patient's medical records is recorded and validated by consensus processes in a distributed, transparent record-keeping system made possible by blockchain technology. By ensuring that access to patient data is restricted by cryptographic keys and that only authorized parties are granted permissions, this decentralized structure removes the possibility of a single point of failure. Furthermore, without sacrificing confidentiality, blockchain can expedite data exchange between healthcare providers, cutting down on delays and enhancing care coordination. Despite its benefits, implementing blockchain in healthcare presents hurdles such as regulatory compliance, interoperability, and scalability. Nevertheless, pilot studies and continuing research are looking into ways to overcome these obstacles. To sum up, blockchain technology is a game-changer for protecting electronic health records, building patient and provider confidence, and improving the healthcare system as a whole.

Keywords: Data breaches, Cyberattacks, Decentralized, Consensus, Cryptographic, Interoperability.

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EXPERIMENTAL EVOLUTION OF TIGECYCLINE RESISTANT IN *ACINETOBACTER BAUMANNII* AND IDENTIFICATION OF NOVEL RESISTANCE ASSOCIATED GENOMIC VARIATION

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Antimicrobial Resistance (AMR) is currently a major problem worldwide, and the death toll is estimated to reach 10 million annually by 2050. The World Health Organization has categorized the priority pathogens under a specific group called 'ESKAPE', where *Acinetobacter baumannii* is a major nosocomial infection pathogen. The emergence of antibiotic resistance in *Acinetobacter baumannii* is essentially the consequence of its high mutagenesis ability along with biofilm formation, persister development, etc. Among some of the last resort antibiotics, tigecycline is a semisynthetic drug derivative of tetracycline used in medical facilities tremendously resulting in Tigecycline-resistance *Acinetobacter baumannii* (TRAB) strain development. Recent reports suggested the emergence of heteroresistance, intermediate-resistance, and resistance strain development against the tigecycline of *A. baumannii* isolates, causing treatment failure in healthcare facilities. In this study, we developed a Tigecycline-

Resistance (TGCR) line by experimental evolution to study the possible resistance development mechanism of *A. baumannii* with reference strain ATCC19606. Clonal populations derived from the evolved lines demonstrated >20-fold resistance against tigecycline. Alongside, the mutants demonstrated cross-resistance against nitrofurantoin, erythromycin, nalidixic acid, and aztreonam, while collateral sensitivity against vancomycin was detected. Among phenotypic attributes, the selection elicited no impact on growth kinetics. The mutants demonstrated no alteration in biofilm formation and adherence to a polystyrene surface. Whole genome sequencing analysis identified nonsynonymous Adenosine deaminase, SAM-dependent methyltransferase, and Putative exported protein precursor. The association of the variations with tigecycline resistance warrants further exploration.

Keywords: *Acinetobacter baumannii*; Tigecycline; Resistance; Cross Resistance; Collateral sensitivity

HEALTHMEDICON/25/PP-189

A BRIEF REVIEW ON THE PHARMACOGNOSTIC STUDY AND PHYTOCHEMICAL SCREENING, PHARMACOLOGICAL ACTIVITY OF SWEET POTATO LEAF

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Sweet potato (*Ipomoea batatas*) is a dicotyledonous plant that belongs to the morning glory family of Convolvulaceae. Sweet potato is a starchy tuber crop being used as a root vegetable and is mainly grown for its root yield and unique nutritional qualities. It is traditionally used in folk medicine and has garnered attention for its potential therapeutic benefits. This study aimed to comprehensively investigate the pharmacognostic, phytochemical, and pharmacological aspects of sweet potato leaves. Pharmacognostic studies were conducted to establish the botanical and morphological characteristics of the leaves. Phytochemical screening was performed to identify the presence of secondary metabolites. The pharmacological profile was investigated through various in vitro and in vivo models to assess the therapeutic potential of the leaf extract. Results revealed distinct pharmacognostic features, a rich phytochemical composition including flavonoids, terpenoids, and phenolic compounds, and promising pharmacological activities such as antioxidant, anti-inflammatory, and antimicrobial properties. These findings provide scientific validation for the traditional use of sweet potato leaves and warrant further exploration of their bioactive compounds for the development of novel therapeutic interventions.

Keywords: sweet potato leaves, pharmacognosy, phytochemical screening, pharmacological activity, antioxidant, anti-inflammatory, antimicrobial.

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**DISCONNECTED CONNECTION: UNVEILING THE EPIDEMIC OF NOMOPHOBIA IN
THE DIGITAL ERA**

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Smartphones have become indispensable in modern life due to their widespread use, convenience and integration into our daily activities. It has now shaped user's identities and behaviours. One emerging disorder "NOMOPHOBIA" has been recognized as a public health issue caused by overuse of smartphones. It is defined as the fear of being without a mobile device. This term originated in England reflecting the anxiety and discomfort characterizing a contemporary phobia of the digital age. In this study, an overall incidence rate has been studied globally. The incidence rate of India and Asia has been studied thoroughly exhibiting 58.1% and 53.4% respectively (moderate to severe level of nomophobia). The data has been collected from residents of metropolitan cities, urban cities, semi-urban towns and rural areas. The signs of NO MOBILE Phone Phobia and its physical and emotional symptoms have been studied. The factors like psychological, demographic, behavioural and lifestyle lead to effects which can be summarized as mental health, physical health and social effects. The phobia's treatment and prevention has been dealt at certain levels for the patient. In this era of ever-changing lifestyles, this phobia is close to becoming a lifestyle disease. This is the reason why preventive measures must be taken, and this phobia must come in the limelight and receive the attention that it requires.

Keywords: Nomophobia, Lifestyle disease, Phobia, Digital age, Disorder.

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**REVIEW OF SUNSCREEN AND THE EMERGENCE OF NON-CONVENTIONAL
ABSORBERS AND THEIR APPLICATIONS IN ULTRAVIOLET PROTECTION**

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The field of sunscreen technology is experiencing a transformative shift with the introduction of non-conventional UV absorbers, expanding the scope of ultraviolet (UV) protection beyond traditional chemical and physical filters. Conventional sunscreens utilize chemical absorbers like avobenzene and octocrylene, or physical blockers such as zinc oxide and titanium dioxide, each with specific benefits and limitations. Recent advancements have brought forth innovative materials, including nanoparticles, organic nanostructures, photostabilizers, bio-based absorbers, and hybrid formulations. Nanoparticles enhance sunscreen transparency and effectiveness, while organic nanostructures offer exceptional UV protection with minimal cosmetic impact. Photostabilizers improve the longevity of sunscreen ingredients, and bio-based absorbers provide environmentally friendly alternatives. Hybrid materials combine diverse UV-absorbing agents to optimize performance. These developments not only promise enhanced UV protection, broader spectrum coverage, and improved cosmetic properties but also address environmental concerns associated with traditional chemical filters. As research progresses, the integration of these non-conventional absorbers is expected to advance both the

efficacy and sustainability of sunscreens, offering more personalized and eco-friendly skin protection solutions.

Keywords: antioxidants, carotenoids, mycosporine-like amino acids, solid lipid nanoparticles, sunscreen, UV absorbers

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CURRENT INNOVATIONS IN PERIPHERAL NERVE STIMULATION FOR NEUROPATHIC PAIN MANAGEMENT

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Neuropathic pain is induced by damage or dysfunction of nerves in the peripheral nervous system or may be in the Central nervous system (Brain and Spinal Cord). Neuropathic pain may occur because of diabetes, stroke or brain injury, multiple sclerosis. Many medicines were involved in the management of neuropathic pain e.g.: Opioids, NSAID's etc. Peripheral nerve stimulation is the good combination with pharmacological treatment of neuropathic pain of peripheral nervous system. Single electrodes with 8-16 contact leads have beneficiary effects in management of neuropathic pain. The implantation of the single electrodes under the skin is done through 14G Tuoy needle in close proximity to the target nerve. The lead insertion is similar to perineural catheter placement. No additional equipment is required to be inserted into patient's body. The procedure is rapid and relatively less traumatic. The external pulse generators, which are wearable in belts, fabric, jewellery, etc., provide power to the implanted wireless leads. The technique eliminates need for an implantable pulse generator (IPG) and tunnelling of the electrodes to IPG, thereby reducing the expense of these therapies. The electrical energy is transmitted from external pulse generator to the implanted leads, inducing action potentials in nearby neurons. New technique of peripheral nerve stimulation has therapeutic effect in relieving of cluster headache, chronic migraine, isolated peripheral neuropathic pain.

Keywords: Peripheral neuropathic pain, Implantable pulse generator (IPG), Action potentials

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CHALLENGES OF IN VITRO GENOME EDITING WITH CRISPR/CAS9 AND POSSIBLE SOLUTIONS: A REVIEW

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Microbial production of bio-based ingredients often requires metabolically engineered bacterial strains with the edited genome. Genome editing tools are also essential for gene identification and investigating genotype-phenotype connections. One of the most common tools of genome editing is based on a natural bacterial adaptive immune system known as CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats)/Cas9 (CRISPR-associated protein 9) due to its simple, rapid, and efficient activities. Although successful in

some in vitro systems, its application as an approach of metabolic engineering and genome editing is still not so extensive. There are a few existing barriers and challenges of the CRISPR/Cas9 editing tool for in vitro systems. Firstly, aim to briefly introduce the CRISPR/Cas9 method as an in vitro gene editing tool. Next, discussing the existing obstacles to CRISPR-based editing in bacterial and in vitro model systems and offers guidelines to help achieve editing in an expanded range of in vitro systems. There are several examples of successful use of the CRISPR method for different genetic goals in various in vitro systems including bacteria, eukaryotic cell lines, fungi, and microalgae. Some of these challenges particularly exist in eukaryotes, and some others only exist in prokaryotes. Taken together, the CRISPR barriers need to be identified and solved to be able to use CRISPR-based gene editing in a broader range of organisms and fields.

Keywords: CRISPR/Cas9, Genome editing, Challenges, Bacteria, In vitro model systems

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A LUCID APOPTOSIS NETWORK TO UNDERSTAND THE BASIC PATHOPHYSIOLOGY OF CANCER

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Apoptosis, a Programmed Cell Death (PCD), specifically refers to an energy-dependent, genetically controlled process by which unnecessary or damaged single cells self-destruct when the apoptosis genes are activated. The role of apoptosis in physiology is as significant as that of its counterpart, mitosis. It helps in maintaining cellular homeostasis in the animal body. The number of cells increase or decrease when there is alteration in apoptosis during normal development and aging or during disease. Abnormalities in cell death regulation may cause diseases/conditions. Some conditions are caused due to insufficient apoptosis whereas others due to excessive apoptosis. A large number of synthetic and natural compounds have been discovered to be effective against certain diseases through the induction of apoptosis in their target cells. The importance of understanding the mechanisms of apoptosis at the molecular level is vital because it provides deeper insight into various disease processes and may thus influence therapeutic strategy. Although many of the key apoptotic proteins that are activated or inactivated in the apoptotic pathways have been identified, the molecular mechanisms of action or activation of these proteins are not fully understood and are the focus of continued research. A better understanding of the apoptosis network may allow for custom tailored cancer therapy, reduced therapy-induced side effects and development of novel therapies for variety of degenerative diseases.

Keywords: Apoptosis, Caspase, Therapeutic intervention, synthetic and natural compound, disease.

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HAPPINESS IS WHAT WE ARE LOOKING FOR

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Happy is what everybody wants to be, yet nobody is happily stating themselves as happy. Why is this happening? If human beings are advancing rapidly with respect to their previous generations, and solving all kinds of issues faced by people, making future life easy and comfortable, then why is it that we are not getting the happiness that we want in our life.

Satisfaction and fulfilment of our wishes feels like making ourselves happier every time we succeed in life. But, on the long run, it is providing us with short amounts of happiness leading to long amounts of time filled with strong emotions that become difficult to handle. Scientific definition of happiness describes it as not merely the absence of negative emotions but a positive state of mind that includes a sense of purpose and connection with oneself and others. Overall, happiness is that feeling that comes over, when we know that life is good and can't help but smile, moving forward in life. This research took its vision towards how people overall describe themselves as happy or unhappy, and why they find that they are not doing good in their lives, inspite of all efforts to beautify life. It has been found that happiness is not a point to achieve, rather a space to be in which has the potential to continuously replenish itself throughout the journey of life.

Keywords: happy, future, satisfaction, scientific, life.

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BETANIN- PROPERTIES, VARIOUS THERAPEUTICS BENEFITS & FUTURE ASPECTS

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With the advancements in research and studies on phytochemicals, it is being discovered that phytomedicines may offer comparable safety and effectiveness compared to synthetic drugs. As many phytochemicals have been identified till date and are continuously been studied for their various crucial therapeutic properties, including antiviral, antidiabetic, anticancer, antioxidant, and cardioprotective effects, these phytocompounds have the potential to treat such conditions with similar efficacy and fewer side effects compared to synthetic drugs.

Hence, phytomedicines demand and researches are emerging constantly. One of such vital phytocompound is Betanin, mostly found in beetroot, which has been found to be used commonly as colourant, pH indicator but is also therapeutically active as anticancer, antidiabetic, antimicrobial action, mostly due to its free radical scavenging properties which basically works to reducing oxidative stress. But one of the major problems with the drug is lack of stability as it is highly sensitive towards heat, oxygen, pH and light which contributes barrier for its formulation development despite being therapeutically rich.

Keywords: Betanin; Oxidative stress; Free radical scavenger; Cancer cell suppressor; Serum insulin elevator.

HEALTHMEDICON/25/PP-197

THE EDUCATION CRISIS: ROLE OF PARENTAL EXPECTATIONS ON STUDENTS' DROPPING MENTAL HEALTH

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In recent years, India has observed a disturbing surge in mental health issues among students. The growing trend among parents to view education to secure financial success or social status rather than holistic development tool. They push their children into a sheep race without thinking about their uniqueness. This paper focuses on how parent's expectations and views on education, forces their children into relentless academic achievement disregarding their individuality and well-being leading to high levels of stress. In contrast to India's traditional educational values, emphasizing on the development of character, wisdom, and self-awareness, the current education system is more reliant upon competition and results. This disregards the care value of education, - "Empowering Individuals". Through this paper, we examine how this pressure and distortion of education effect's students' mental health, calling for a reappraisal of parental expectation and educational practices. This paper advocates for a balanced approach which fosters both academic excellence and emotional well-being of individuals, enabling individuals to pursue their passions and express their unique identities, ultimately contributing to the creation of a more harmonious society.

Keywords: Mental Health; Parental Role; Education System; Depression; Stress.

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ROLE OF CORNEAL HYSTERESIS IN DETECTING GLAUCOMA

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Glaucoma is a chronic eye disease that can cause vision loss or blindness by damaging the optic nerve. It is usually caused by fluid buildup in the front of the eye, which increases pressure inside the eye. Several former methods such as - Tonometry, Dilated Eye Exam, Optical Coherence Tomography (OCT), Fundus Imaging, Visual Field Test, Pachymetry and Gonioscopy- were used in detecting Glaucoma. But with Corneal Hysteresis coming into the limelight, it serves to be one of the best methods in detecting Glaucoma. As recent advancements take a pace, Corneal Hysteresis proves to be a well-practiced and researched phenomenon. Corneal Hysteresis is a measurement of the cornea's ability to absorb and dissipate energy. It is a tissue property that reflects how the cornea reacts to an external force. Corneal Hysteresis is a measure of the cornea's viscoelastic damping, which is a combination of elasticity and viscosity. CH can be used to help diagnose Glaucoma and assess its progression. It could be used in combination with other parameters, like IOP and central corneal thickness (CCT), to create risk stratification models. There is no treatment for Glaucoma, but early treatment can often stop the damage and protect one's vision. Corneal Hysteresis can be a great start to that.

Keywords : Glaucoma, Corneal Hysteresis, Eye Health.

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THE IMPACT OF SPECTACLE LENSES FOR MYOPIA CONTROL ON VISUAL FUNCTION

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Near sightedness occurs known as myopia has become an increased global pandemic; and in recent years, inquiries have been placed before scientists and contact lens specialists, significantly in the realm of spectacle lenses designed for correcting myopia. Orthopracitic-prescriptive spectacle lenses for myopia error correction specially designed for managing pediatric and adolescent myopia try to employ specific optical combinations. The initial development and progression of myopia control lenses, as well as any subsequent issues, such as retinal detachment and glaucoma, have been shown by various clinical investigations to result in enhanced visual performance especially under dynamic visual loading conditions. Enhanced accommodation to peripheral defocus, fostered through the use of sophisticated lens materials and technology, is the means of controlling the progression of myopia. Management of myopia will necessitate a thorough development of the regimen to understand the effect of these lenses on visual functioning. Future long-term benefits of myopia control lenses will affect visual health outcomes in longitudinal studies. In addition, innovation-like in manufacturing itself may increase their efficacy with many creative ways to control myopia. The rapidly growing prevalence of these diseases will necessitate the awareness of eye care professionals in the current trends in lens technology and how it can be used in patient management. The present data promises a relatively bright future for the management of myopia with lenses and methods that may change the way myopia is practiced on clinical grounds.

Keywords: Myopia Control, Pediatric Myopia, Spectacle Lenses, Visual Performance, Lens technology

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NANOTECHNOLOGY IN OPTICAL COATING FOR CONTACT LENSES

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Nanotechnology has revolutionized the contact lens industry with advanced photo coatings. Incorporating nanoparticles into lens materials designed for innovative solutions against microbial growth over contact lens surface, discomfort, visual performance challenges, etc. For example, integrated plasmonic silver nanoparticles in contact lenses exhibit selective filtering properties, blue light image and visibility and significantly reduce fatigue and hence improve quality, provide lens hydration and the user comfort value is greater. However, these coatings often present challenges such as oxygen depletion, which must be addressed to maintain optimal corneal health. In addition, graphene-based coatings have been investigated

to increase the hydration of touch lenses, possibly improving wearer comfort. In addition, advances in nanotechnology have paved the way for smart contact lenses with embedded sensors for real-time health monitoring including detection of glucose levels through tear fluid analysis and antibacterial coatings made of zinc oxide and titanium dioxide, as well as UV-resistant nano coatings also greatly improve the longevity and safety of the contact lenses. However, critical conditions remain in production complexities, cost, and ensuring biocompatibility. Nanotechnology incorporated into optical coatings has the potential to revolutionize the industry by enabling multifunctional lenses to be used beyond vision correction, such as medical research services.

Keywords: Nanotechnology, Optical Coatings, Contact Lenses, Silver Nanoparticles, Graphene Coatings

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TRADITIONAL AND MODERN TECHNIQUES : MANAGEMENT OF AMBLYOPIA IN ADULTS

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Amblyopia, referred to as "dullness of vision," is a condition that is defined when one eye has diminished vision due to the visual pathway from the eye to the brain not developing properly. The less-used eye develops poor vision because of the brain preferring one eye over the other. This eye condition is more difficult to treat in adults, although it can be avoided with early childhood intervention. Strabismus, or eye misalignment, and severe refractive error in one eye are common causes. Corrective lenses, eye patches, and vision therapy are possible forms of treatment, although after childhood, chances of success are reduced. Enhancing brain-eye synchronization and activating the weaker eye are the main goals of treating adult amblyopia. Exercises to enhance eye coordination, tracking, and focus are known as vision therapy. Patching, digital therapies, and lifestyle modification are included for the treatment of adult amblyopia.

Keywords: Amblyopia, Strabismus, Synchronization, Patching.

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CORRECTION OF MYOPIA WITH ORTHOKERATOLOGY

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Orthokeratology, or Ortho-K, is a non-surgical mind therapeutic contact lens used here, in addressing myopia and decreasing its progression, especially in children. It is a technique for temporarily reshaping the cornea by wearing customized stiff gas permeable contact lenses overnight. Ortho-K reduces refractive error by reshaping the cornea, eliminating the need for

corrective lenses for comfort during the day. By lowering axial elongation, one of the main causes of myopia, Ortho-K decreases the advancement of myopia by 45% over a two-year period, according to recent clinical research. The effectiveness of the treatment is attributed to its capacity to reduce peripheral hyperopic defocus, which is thought to be a major factor in the onset and advancement of Myopia. As the prevalence of myopia rises worldwide, Ortho-K is a good substitute for the more comprehensive therapy to myopia in Paediatric ophthalmology.

Keywords: Myopia correction, Corneal reshaping, Myopia progression control, Refractive error, Paediatric myopia management.

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A REVIEW UPON HEPARIN INDUCED THROMBOCYTOPENIA AND HEMODIALYSIS

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Hemodialysis is the blood cleansing system for patients with chronic kidney disease (CKD) or end stage renal disease through an artificial separation of impurities, electrolytes and fluid from the body. Heparin is used as dialyzer because it's unfractionated form makes blood flow easy and also best for waste collection. Long-term use of heparin was the cause with this patient by triggering a serious side effect called as Heparin induced thrombocytopenia. Other than bleeding, the most obvious complication is auto-immune pathology caused by heparin treatment manifesting as thrombocytopenia. The immune complex made up of anti-platelet factor 4 (PF4) autoantibodies and a heparin-PF4 complex is central to the pathogenesis of HIT. The antibodies bind to platelets and monocytes, inducing cross-linking of the Fc γ IIA receptors thereby activating these cells. Arterial and venous thrombosis can be a manifestation of these activation that evolves into an over-activation, leading to excesses in the numbers. Thus, the pathological mechanism of anti-PF4/heparin antibodies results from immune complexes that activate coagulation (dependent upon their capacity to interact with both vessels and blood-forming cells), by formation platelet microparticles or increasing procoagulant activity. Likewise, the thrombocytopenic diagnosis includes testing of platelet activation and anti-PF4/heparin antibodies. According to a later research, only 4% of patients treated with heparin on chronic hemodialysis skeleton experienced their lowest platelet counts after more than one month of treatment. This brief is presented as a supporting source to medical specialists helping them grasp the causes, mechanisms, and the resulting thrombocytopenia treatment methods in hemodialysis patients.

Keywords: Hemodialysis, Heparin, Heparin-associated thrombocytopenia, PF4-heparin complexes, Anti-Platelet factor-4 antibodies.

HEALTHMEDICON/25/PP-204

METHODS FOR IDENTIFYING AND PREVENTING ADULTERATION IN HERBAL SUPPLEMENTS

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The rising mandate for herbal supplements has led to enflamed adulteration and conciliatory consumer safety and trust. Adulteration may result from intentional substitution, contamination, or mislabelling, highlighting the need for robust quality control procedures to ensure product legitimacy and safety. This review highlights key methods for recognizing and avoiding adulteration in herbal supplements. Botanical identification techniques include macroscopic and microscopic examination, DNA barcoding, and phytochemical analysis to validate plant materials. Chromatographic methods, such as high-performance liquid chromatography (HPLC), gas chromatography (GC), and thin-layer chromatography (TLC), are indispensable for detecting impurities and adulterants. Spectroscopic approaches, including infrared (IR) and nuclear magnetic resonance (NMR) spectroscopy, provide chemical fingerprinting for product confirmation. Stable isotope analysis is valued for verifying geographic origin and recognizing potential adulteration. Furthermore, adherence to Good Manufacturing Practices (GMPs) helps maintain quality control throughout the supply chain. By participating in these methodologies, manufacturers, and controllers can enhance the veracity and safety of herbal supplements, fostering consumer sureness and mitigating health risks related to adulterated products.

Keywords: herbal supplements, adulteration, quality control, botanical identification, chromatography, HPLC, TLC, spectroscopy.

HEALTHMEDICON/25/PP-205

PREPARATION OF NANO EMULGEL CONTAINING HERBAL OIL FOR DEEP MOISTURIZING

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The moisturizing herbal oil base nano-emulgel was developed and characterized using a new concept: its multi-use in cosmetic therapy, which entails a thorough examination of several important factors to guarantee the best possible results and skin advantages. The choice of certain oils, emulsifiers, gelling agents, and formulation techniques imparts factors including the size and distribution of nano-oil globules within the emulsion. The gel matrix's rheological characteristics and desired skin effects are important factors that determine the emulgel's stability and effectiveness in a variety of circumstances. These factors also make the emulgel compatible with different skin types, which is necessary to ensure consistent quality and performance. Additionally, evaluating the emulgel's moisturizing efficacy through in vitro and in vivo research confirms that the nano-oil globules in the product may effectively treat chronic

skin issues, increase skin moisture levels, and improve skin texture. The encouraging findings of these tests suggest that the moisturizing nano-emulgel has a great deal of promise as a novel treatment for those with persistently dry skin and associated disorders. It is anticipated that more research and development will improve the emulgel's composition, increase its applicability in a variety of therapeutic and cosmetic contexts, and establish it as a notable breakthrough in the skincare product industry.

Keyword: moisturizing, nano-emulgel, cosmetic therapy, rheological characteristics, skin texture.

HEALTHMEDICON/25/PP-206

A ROUTINE SEASONAL SURGE OR AN EMERGING HEALTH THREAT

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Human metapneumovirus (HMPV) is a common respiratory virus associated with seasonal outbreaks, primarily affecting vulnerable populations such as young children, older adults, and immunocompromised individuals. Historically considered a routine seasonal pathogen, HMPV has recently garnered attention due to its increasing incidence and clinical severity in certain regions. This raises critical questions about whether it remains a predictable seasonal surge or is evolving into a broader health threat. This study explores epidemiological trends, risk factors, and clinical outcomes of HMPV. Using global surveillance data and recent outbreak analyses, we identify key factors driving its resurgence, including the impact of climate variability, reduced immunity following COVID-19 restrictions, and co-infections with other respiratory pathogens. Our findings highlight a notable rise in hospitalization rates and severe respiratory complications, particularly in high-risk groups. Given its growing burden on healthcare systems, HMPV necessitates enhanced diagnostic tools, expanded surveillance, and targeted public health strategies. Additionally, the development of vaccines and antiviral therapies could play a critical role in mitigating its impact. By assessing HMPV's trajectory, this study emphasizes the need for proactive measures to address its potential transition from a seasonal occurrence to an emerging global health threat.

Keywords: HMPV, Seasonal surge, Respiratory viruses, Emerging health threats, Public health.

HEALTHMEDICON/25/PP-207

AN OVERVIEW ON HERBAL APPROACHES USED IN HYPERTENSION

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Hypertension, or high blood pressure, is a major global health concern. While conventional medications are effective, many individuals seek alternative therapies, including herbal remedies. here are several types of synthetic drugs used to treat high blood pressure, including Angiotensin-converting enzyme (ACE) inhibitors, Angiotensin II receptor blockers, Diuretics, Beta-blockers, Calcium channel blockers, Alpha-blockers, Alpha-agonists, Renin inhibitors,

Combination medications to lower the prevalence of hypertension, governments are putting more effort into improving public awareness and lowering food salt intake. Several types of herbal drugs (garlic, cardamom, cinnamon, basil, green tea etc.) provide a number of potential benefits over synthetic pharmaceuticals in the treatment of hypertension such as fewer side effects with improved patient compliance. The objective of present work is to focus on herbal drugs and herbal drug loaded formulations used in the treatment of hypertension with the special emphasize on future prospectives of the phytopharmaceuticals for the same. Numerous herbs have been traditionally used to manage hypertension, and scientific research is increasingly supporting their potential benefits. This abstract focuses on herbal medications commonly used for hypertension, their mechanisms of action, and their potential benefits and risks. Some of the most well-studied herbs include Garlic (*Allium sativum*): Garlic contains compounds like allicin, which have been shown to lower blood pressure by relaxing blood vessels and reducing inflammation. Ginger (*Zingiber officinale*): Ginger may help lower blood pressure by improving blood vessel function and reducing oxidative stress. Hawthorn (*Crataegus spp.*): Hawthorn berries contain flavonoids that can relax blood vessels and improve heart function. Hibiscus (*Hibiscus sabdariffa*): Hibiscus tea has been shown to lower blood pressure by increasing urine output and relaxing blood vessels. Herbal remedies can offer a natural approach to managing hypertension, some herbs may interact with other medications or have potential side effects. Additionally, the quality and standardization of herbal products can vary, making it important to choose reputable brands. Further research is needed to fully understand the efficacy and safety of herbal medications for hypertension. However, preliminary findings suggest that certain herbs may offer a promising complementary approach to conventional treatments.

Keywords: Conventional medication, Garlic, Herbal medication, Hypertension, Potential benefits.

HEALTHMEDICON/25/PP-208

HERBAL APPROACHES USED IN PARKINSON'S DISEASE: AN OVERVIEW

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Parkinson's disease is a long-term neurological condition affecting the midbrain Substantia nigra. It is a progressive degeneration of dopaminergic neurons, which lowers dopamine levels. Myotonia, dyskinesia, tremor, and other symptoms are typically observed in the diseased person. Medical treatment for Parkinson's disease (PD) is challenging, particularly given the ongoing aging of the population. Drugs have been created to slow the progression of Parkinson's disease; however, the ones that are currently on the market have drawbacks and adverse effects. As a result, there is a need for novel medications free of the restrictions and adverse effects of widely used medications. As a result, research on natural extracts and traditional medicine has increased dramatically. Thus, the purpose of this study is to look into how plant-derived extracts and herbal remedies can be used alongside with traditional medication to treat Parkinson's disease and also to focus on Ayurvedic medication, yoga and physical exercises. As of right now, Herbal Medication is widely used to treat PD, particularly in Asian nations. Herbal medicines like turmeric, ginger and Ginkgo biloba may slow Parkinson's progression. Herbs like *Mucuna pruriens* and *Bacopa monnieri* enhance motor function. Ashwagandha may improve cognitive function. When compared to traditional

pharmaceuticals, herbal remedies frequently result in fewer gastrointestinal adverse effects. Reduce the negative effects of traditional medications and also increase the efficacy of traditional treatment. Handle symptoms that are resistant to medicine and those that don't respond to standard care. Yoga training and balancing exercise can enhance the level of postural control and improve balance in PD patients.

Keywords: Exercise, Herbal Medication, Parkinson's disease, Substantia nigra, Traditional medication

HEALTHMEDICON/25/PP-209

DESIGN AND EVALUATION OF PACLITAXEL LOADED PROTEIN-BASED NANOPARTICLE FOR BRAIN TARGETING

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A brain-targeted drug delivery system is a method for delivering drugs to the brain to treat brain diseases. Brain-targeted drug delivery allows targeted therapy with a higher therapeutic efficacy and low side effects because it targets moieties present in the drug delivery systems. Protein-based nanoparticles are nano-sized particles composed of proteins, either naturally occurring or recombinantly engineered, that are designed to encapsulate, deliver, or target specific molecules, such as drugs, nucleic acids, or imaging agents, to specific sites in the body. Paclitaxel is an antineoplastic drug with low solubility and poor permeability, which limits its application in the treatment of brain tumours. So, paclitaxel loaded protein-based nanoparticles were prepared using the desolvation technique. The objectives of the present investigation are to prepare paclitaxel loaded protein-based nanoparticle for effective brain delivery, to enhance the solubility, to improve the bioavailability and permeability of the drug.

Keywords: Brain targeting, protein-based nanoparticles, paclitaxel, desolvation.

HEALTHMEDICON/25/PP-210

DRUG RESISTANT TUBERCULOSIS: CHALLENGES AND CURRENT TREATMENT STRATEGIES

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Mycobacterium tuberculosis causes the infectious disease tuberculosis (TB), which is one of the biggest risks to public health worldwide. There has been a noticeable decline in TB morbidity and death since the introduction of first-line anti-TB medications. However, TB incidence has grown due to the emergence of extensively drug-resistant (XDR) and multidrug-resistant (MDR) strains, the twofold prevalence of HIV-TB co-infection, and the lack of adequate access to affordable healthcare. In light of extremely resistant strains, it is observed that the medications currently used to treat tuberculosis have proven unsustainable. After decades of stalling in the development of anti-TB medications, appreciatively, five types of new medications and candidates with novel mechanisms of action have surfaced in the field of

anti-TB research. The research status of these prospective anti-TB medications and prospects is discussed in this study, with a focus on the issues that need to be resolved for the effective development of future TB treatments.

Keywords: Mycobacterium tuberculosis, Tuberculosis (TB), Multidrug-resistant (MDR)

HEALTHMEDICON/25/PP-211

FLUOXETINE LOADED MICRONEEDLE ARRAYS FOR IMPROVED TOPICAL PERMEABILITY: DESIGN AND CHARACTERIZATION

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Transdermal drug delivery is an alternative route of administration that offers avoidance of the associated drawbacks of orally and parenterally administered drugs. Transdermal delivery has the advantage of bypassing the first pass effect and allowing controlled release of the drug. However, drug delivery is limited owing to the barrier created by the stratum corneum. Microneedle array is a type of transdermal patch that differs from the traditional patch design due to the presence of tiny, micron sized needles that permit enhanced drug permeation on their application surface. Microneedle array patch upon application on the skin, painlessly and without drawing blood, penetrate through the stratum corneum and creates a temporary channel through which drug molecules delivered at the deepest layer of the skin

Keywords: Transdermal drug delivery, control release, microneedle array patch, permeation.

HEALTHMEDICON/25/PP-212

ROSUVASTATIN LOADED NANOLIPOSOME ENHANCED TOPICAL PERMEABILITY: DESIGN, AND CHARACTERIZATION

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Transdermal drug delivery is another approach as an alternative route of administration that offers avoidance of the associated drawbacks when the drugs are administered in oral or intravenous route. Transdermal drug delivery bypasses the first pass effect and allows controlled release of the drug. However, the stratum corneum is the only barrier limits the amount of drug that may be delivered. Nanoliposome have small particles and structural similarity to the human skin's lipid bilayer helps them to penetrate the skin better. So, the topical administration of nanoliposome in the form of nanoliposome gel is an excellent alternative for ensuring efficient drug delivery and potentially improving the therapeutic outcome.

Keywords: Transdermal drug delivery, Nanoliposome, permeation, Stratum corneum

HEALTHMEDICON/25/PP-213

UNLOCKING THE POWER OF NATURE: EXPLORING THE SCIENCE OF MEDICINE FROM NATURAL SOURCES

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Summery recent years, there has been a growing recognition of the potential benefits and scientific interest in medicines derived from natural sources. This field encompasses a diverse array of substances, ranging from traditional herbal remedies to modern biotechnological advancements. Here's a detailed exploration of this captivating topic Historical Significance Ancient Original Many cultures have a rich history of using plants and natural substances for medicinal purposes, dating back thousands of years. Traditional Knowledge Indigenous practices often hold valuable insights into the therapeutic properties of local flora and fauna. Modern Scientific Approach Phytochemistry The study of plant-derived compounds (phytochemicals) has unveiled numerous bioactive substances with potential medicinal applications. Bioprospecting Systematic exploration of biodiversity hotspots has led to the discovery of novel compounds with pharmaceutical potential. Examples of Natural Medicines Herbal Remedies Plants like ginseng, turmeric, and echinacea are used worldwide for their purported health benefits. Marine Biotechnology Extracts from marine organisms, such as sponges and corals, show promise in drug discovery for conditions like cancer and infections. Pharmacological Insights Mechanisms of Action Understanding how natural compounds interact with biological systems provides insights into their therapeutic effects. Synergistic Effect Combinations of compounds in natural medicines may enhance efficacy and reduce side effects compared to single-agent drugs. Challenges and Opportunities Standardization Ensuring consistent potency and quality of natural products poses challenges due to variability in plant chemistry and extraction methods. Regulatory Hurdles Bringing natural medicines to market requires navigating complex regulatory frameworks that vary by region. Future Directions Biotechnological Advances Genetic engineering and synthetic biology offer new ways to produce natural compounds with improved properties. Integration with Conventional Medicine The potential for combining natural remedies with modern pharmacotherapy presents exciting avenues for personalized medicine. Exploring the science of medicine from natural sources represents a convergence of ancient wisdom and modern scientific rigor. By unlocking the power of nature, researchers and healthcare practitioners can harness a vast reservoir of potential therapies for the benefit of global health. This interdisciplinary field continues to evolve, driven by curiosity, technological advancements, and a growing appreciation for the ecological and cultural importance of biodiversity in healthcare. As we delve deeper into the complexities of natural medicines, we pave the way for a more sustainable and holistic approach to healing.

Keywords: Natural Products, Biomedicine, Phytochemistry, Drug Discovery, Medicinal Plants, Bioactive Compounds, Nature-Inspired Therapeutics.

HEALTHMEDICON/25/PP-214

FUTURE OF MYOPIA MANAGEMENT

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By 2050, myopia, also known as near-sightedness, is expected to impact more than 50% of the world's population, making it a rising worldwide health problem. The management of myopia in the future will centre on creative approaches to deal with its rising incidence and related issues, such as myopic maculopathy, retinal detachment, and visual impairment. In order to successfully limit progression, emerging approaches combine improvements in optical technology, pharmaceutical treatments, and lifestyle changes. Innovative designs for contact lenses and glasses, such as orthokeratology and defocus- incorporated multiple-segment (DIMS) lenses, provide promising optical solutions. Axial elongation can be effectively reduced with little adverse consequences using pharmaceutical methods, especially low-dose atropine eye drops. Changes in the environment and behaviour, with a focus on outside exposure and controlled near-work activities, continue to be crucial preventative interventions. Furthermore, it is anticipated that big data analytics and artificial intelligence (AI) would transform the management of myopia by facilitating early identification through predictive modelling and individualized treatment strategies. New directions for customized treatments that target underlying genetic predispositions may also be made possible by advancements in genetic research. Future myopia management offers a diverse strategy to lessen its impact as multidisciplinary cooperation between academics, physicians, and technology developers grow. To combat the myopia pandemic and protect visual health globally, it will be essential to combine patient-centred treatment, state-of-the-art technologies, and public health activities.

Keywords: myopia management, optical solutions, low-dose Atropine, AI in ophthalmology, public health.

HEALTHMEDICON/25/PP-215

A COMPREHENSIVE REVIEW ON NEW DRUGS DEVELOPMENT STUDIES

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Drug development is the process of introducing a new and effective drug to cure a disease once a primary compound has been established along the course of drug discovery. Traditional methods often face challenges in terms of efficacy, delivery, and patient compliance. Recent advancements in drug delivery and computational technologies offer potential solutions to these hurdles. This poster explores innovative approaches to new drug development studies, focusing on enhancing drug delivery, optimizing therapeutic efficacy, and enabling personalized medicine. The poster will delve into key aspects of drug development, including compound identification, synthesis, target validation, and efficacy assessment. Stability, bioavailability and administration are the factors that must be considered during formulation. Methods of chemical, pharmacodynamic, and pharmacokinetic parameters will also be discussed. Emphasis will be placed on the role of nanotechnology, computational methods, and AI in accelerating drug discovery and development. Additionally, the integration of biologically active materials for improved drug delivery systems will be discussed. The poster will highlight recent advancements in

drug delivery techniques, such as liposomes and nanoparticles, and their potential to improve drug targeting and reduce side effects. The application of computational methods, including molecular modeling and bioinformatics, for drug design and optimization will be presented. Next-generation sequencing and omics technologies provide comprehensive insights into genetic, proteomic, and metabolomic profiles, enabling targeted drug development and personalized medicine. By combining nanotechnology, computational tools, and AI, the pharmaceutical industry can significantly enhance drug development efficiency and effectiveness. This poster will provide a comprehensive overview of these emerging technologies and their potential impact on human health. Challenges and future directions in the field will also be discussed.

Keywords: Drug development, Developments process, AI, Technology, Omics technologies.

HEALTHMEDICON/25/PP-216

TRANSFORMING TYPE-1 DIABETES MANAGEMENT: FROM INSULIN INJECTIONS TO BETA-CELL REPLACEMENT VIA STEM CELLS

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Type 1 diabetes mellitus (T1DM) is an autoimmune disorder characterised by the destruction of pancreatic β -cells, leading to the loss of insulin-producing islets. Although β -cell transplantation has proven to be a curative option for T1DM, its broader application is hindered by the rising prevalence of diabetes, a limited supply of donor β -cells, and the necessity for lifelong immunosuppression. Consequently, alternative strategies to β -cell replacement have been explored, with stem cell transplantation emerging as one of the most promising approaches. Recent studies indicate that stem cells hold significant potential for treating T1DM by promoting immune tolerance and preserving β -cell function. Clinical trials utilising cGMP-grade stem cell products have demonstrated favourable outcomes, with evidence of therapeutic benefit and minimal adverse effects. Among the various types of stem cells under investigation, mesenchymal stem cells (MSCs), human embryonic stem cells (hESCs), and bone marrowderived haematopoietic stem cells (BM-HSCs) have shown particular promise. MSCs have been found to exhibit immunomodulatory properties, protecting β -cells from autoimmune attack, while hESCs can differentiate into insulin-producing cells under appropriate conditions. BMHSCs contribute to immune system regulation and may support β -cell regeneration. Together, these approaches offer new avenues for improving outcomes in T1DM by restoring immune balance and β -cell functionality. This review highlights advancements in stem cell transplantation for T1DM and examines its clinical applications, providing a basis for further research into achieving remission through innovative therapeutic strategies.

Keywords: Autoimmune, Broader, hESCs, Immunosuppression, Transplantation

HEALTHMEDICON/25/PP-217

**LIVING BEYOND COVID-19: UNDERSTANDING THE LONG-TERM
IMPACT OF POST-COVID SYNDROME**

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This poster focuses on understanding Post-COVID Syndrome (PCS), commonly known as Long COVID, which refers to ongoing health problems experienced by people after recovering from COVID-19. PCS affects individuals differently, regardless of how severe their initial illness was. The goal of this poster is to highlight the common symptoms and challenges faced by those living with PCS and emphasize the need for long-term care and support. Many individuals with PCS experience persistent symptoms, including extreme tiredness, muscle weakness, difficulty breathing, body aches, digestive problems like diarrhea, and mental health issues such as anxiety, depression, and trouble concentrating. Joint pain and digestive issues are particularly common, affecting over 40% of people with PCS, while symptoms like fatigue and difficulty focusing impact at least 20%. These symptoms often overlap and can last for weeks or even months, causing significant challenges in daily life. PCS can affect multiple body systems, including muscles, lungs, digestion, and mental health, with symptoms varying widely from person to person. By addressing these longterm effects, we aim to raise awareness of the physical and emotional toll of PCS and underline the importance of identifying better ways to support recovery and improve quality of life for affected individuals.

Keywords: Post-COVID Syndrome, PCS, Quality of Life, Long COVID.

HEALTHMEDICON/25/PP-218

**COMBATING CANCER MULTIDRUG RESISTANCE WITH P-GLYCOPROTEIN
TARGETED NANOMEDICINE**

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Multidrug resistance (MDR) among cancer patients, largely caused by P-glycoprotein (P-gp), is one of the major constraints for chemotherapy to be fully effective. P-gp, an ATP-binding cassette transporter, decreases the intracellular concentration of drugs, lowering the effectiveness of diverse anticancer therapies. The concept of using nanotechnology has emerged as a possible solution to the problem of drug resistance triggered by P-gp through the design of nanosized delivery systems. These strategies use nanoparticles, liposomes, dendrimers, micelles, and polymeric carriers to circumvent the efflux pump or reduce it and improve the bioavailability of the drug by targeting the tumor cells directly.

Nanomedical technologies accomplish this by formulating an anticancer drug in a chemotherapy-encapsulating structure that can resist hydrolysis and achieve depot-action at the site of the tumor. Ligand-decorated platforms can achieve active targeting of cancerous cells to minimize unwanted side effects. Moreover, nanocarriers may also be co-loaded with P-glycoprotein antagonists, siRNA or gene editing tool that can inhibit P-glycoprotein from being produced or its action, making it possible for drugs to reactivate effectiveness against the cancer. Broad classes of nanomaterials responsive to environmental stimuli such as pH,

temperature and redox potential forms are emerging to promote the delivery of drug molecules in the selective target environment.

Keywords: P-glycoprotein, multidrug resistance, nanomedicine, cancer therapy, targeted drug delivery

HEALTHMEDICON/25/PP-219

EVALUATING IMPACT OF PAROXETINE ON CARVEDILOL PHARMACOKINETICS IMPLICATIONS FOR HEART DISEASE MANAGEMENT

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Carvedilol is a beta-blocker commonly used to treat heart failure and high blood pressure. It is primarily broken down in the body by an enzyme called CYP2D6. Paroxetine, an antidepressant, strongly blocks this enzyme, which could affect how carvedilol is processed in the body. This study looks at how taking paroxetine alongside carvedilol changes the way carvedilol is absorbed, broken down, and eliminated. It also examines what this means for people with heart disease. The findings show that paroxetine increases the levels of carvedilol in the bloodstream by slowing its breakdown. This could enhance carvedilol's effects but also increase the risk of side effects like slow heart rate, low blood pressure, and fatigue. Adjusting the dose of carvedilol and closely monitoring patients are crucial to safely managing this combination.

Keywords: Carvedilol, Paroxetine, Drug interaction, Blood pressure, Pharmacokinetics

HEALTHMEDICON/25/EPP-001

DISCOVERY OF HYDRAZONE TETHERED 1,4-BENZODIOXANE DERIVATIVES AS POTENTIAL THERAPEUTICS FOR CANCER: IN-SILICO, IN-VITRO, AND IN-VIVO STUDIES

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A novel series of 1,4-benzodioxane derivatives (**Compounds 7a-I**) were designed and synthesized using the Wolff-Kishner reaction in absolute ethanol. The synthesized compounds were evaluated for their anticancer potential against a panel of NCI-60 cell lines. Among these, compound **7e** emerged as the most potent, prompting further investigation through a five-dose anticancer assay, which confirmed its significant cytotoxic activity. The efficacy of compound **7e** was further assessed on MDA-MB-435

skin cancer cell cultures using cell death assays and cell cycle analysis, revealing its ability to induce apoptosis and cell cycle arrest. The acute oral toxicity studies demonstrated its safety profile. Molecular docking studies indicated a strong binding affinity of compound **7e** to the mTOR protein (docking score: -8.105 kcal/mol), with favorable interactions supporting its mechanism of action. Compound **7e** adhered to Lipinski's rule of five and exhibited acceptable ADMET properties. Molecular dynamics simulations confirmed the stability of the ligand-protein complex over a 200 ns span. Furthermore, a comprehensive structure-activity relationship (SAR) analysis was established, integrating in vitro, in vivo, molecular docking, and dynamics studies. These findings highlight compound **7e** as a promising candidate for further anticancer drug development.

Key Words: 1,4-Benzodioxane, Anticancer agents, Apoptosis, Molecular Docking studies, Molecular Dynamics

HEALTHMEDICON/25/EPP-002

FORMULATION AND DEVELOPMENT OF A MICRONEEDLE-BASED DRUG DELIVERY SYSTEM FOR THE TREATMENT OF ALOPECIA

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Alopecia areata (AA) is an autoimmune disorder leading to hair loss. Current treatments, including topical and systemic therapies, often suffer from poor efficacy and systemic side effects. Dissolving microneedles (DMNs) offer a minimally invasive, targeted drug delivery method that bypasses the skin barrier and delivers therapeutic agents directly to affected areas. To develop and evaluate dissolving microneedle patches for localized, effective delivery of therapeutic agents for alopecia areata therapy. DMNs were made using biocompatible polymers like (PVP,PVA) and loaded with therapeutic agents. DMNs demonstrated effective skin penetration and rapid dissolution within the dermal layer. Sustained drug release led to localized suppression of immune-mediated inflammation in alopecia models. Dissolving microneedles represent a promising approach for alopecia areata therapy, enabling localized drug delivery with improved efficacy and reduced systemic side effects. This targeted therapy could revolutionize the treatment paradigm for alopecia patients.

Keywords: Alopecia areata, dissolving microneedles, localized drug delivery, hair regrowth, immune modulation, minimally invasive therapy.

HEALTHMEDICON/25/EPP-003

EXPLORING *Euphorbia tithymaloides* FOR DIABETIC NEUROPATHY: A NETWORK PHARMACOLOGY APPROACH

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Euphorbia tithymaloides, a member of the Euphorbiaceae family, has been studied for its potential antidiabetic properties and its ability to manage hyperglycaemia and inhibit the formation of advanced glycation end products. A debilitating consequence of diabetes, diabetic neuropathy (DN) is characterized by gradual nerve damage that impairs quality of life, causes

persistent pain, and results in sensory loss. The management of DN is still difficult despite the availability of medications because of their poor effectiveness and serious adverse effects. This study employs a network pharmacology approach to explore the therapeutic potential of *Euphorbia tithymaloides* in managing diabetic neuropathy. Bioactive compounds from the plant were identified through literature and database mining, followed by analysis of their drug-likeness using computational tools. Potential targets for DN were screened in GeneCards, SuperPred and Venny analysis identified overlapping targets associated with diabetic neuropathy pathway. Common targets of drugs and diseases were selected for analysis in the STRING database, and the results were imported into Cytoscape 3.10.1 to construct a protein-protein interaction network, while, elucidating the biological processes and signalling pathways involved. Our results reveal that key bioactive constituents of *Euphorbia tithymaloides* interact with multiple therapeutic targets implicated in oxidative stress, inflammation, and neuronal repair, which are central to DN pathogenesis. The findings provide a foundation for experimental validation and support the utility of network pharmacology in accelerating drug discovery from traditional medicine.

Keywords: *Euphorbia tithymaloides*, diabetic neuropathy, network pharmacology, Cytoscape, multi-target therapy.

HEALTHMEDICON/25/EPP-004

A COMPREHENSIVE REVIEW OF APABETALONE: MECHANISMS, BIOMEDICAL APPLICATIONS, AND FUTURE PROSPECTS

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Apabetalone (AB) is a pioneering inhibitor of bromodomain and extra terminal (BET) proteins, exhibiting preferential affinity for the second bromodomain (BD2). By concentrating on the epigenetic regulation of gene expression, AB offers a novel therapeutic approach that can be used to treat several conditions characterized by fibrosis, impaired lipid metabolism, and persistent inflammation. This comprehensive analysis looks at its therapeutic applications, mechanisms of action, and applications in precision medicine in the future. By reducing major adverse cardiac events (MACE) in high-risk adults with diabetes, chronic kidney disease (CKD), and recent acute coronary syndromes, AB has demonstrated significant promise for cardiovascular health. Its transformative potential is highlighted by its ability to simultaneously control lipid profiles, vascular calcification, and inflammation. Apart from its cardiovascular applications, AB has demonstrated efficacy in lowering pro-inflammatory conditions and treating the consequences of chronic kidney disease (CKD). Apart from its cardiovascular applications, AB has demonstrated efficacy in lowering pro-inflammatory conditions and treating the consequences of CKD. The antiviral properties of AB, such as its capacity to alter SARS-CoV-2 viral entry mechanisms, have been highlighted by recent studies, making it a potentially effective treatment for infectious diseases. Its anti-inflammation and neuroprotective qualities offer hope for the treatment of neurological disorders, while preclinical research suggests that it may be able to prevent tumor growth in cancer by suppressing oncogene expression. Even though they are frequently well tolerated, short-term elevations in liver enzymes observed in clinical trials require ongoing observation and long-term safety evaluations. In conclusion the ability of AB to target a wide range of illness pathways highlights its potential to revolutionize treatment paradigms in a variety of medical specialties. As a novel epigenetic treatment, AB aids in the creation of next generation BET inhibitors.

Keywords: Apabetalone, BET inhibitors, cardiovascular diseases, chronic renal disease, metabolic disorders, inflammation.

HEALTHMEDICON/25/EPP-005

EFFECT OF *Medicago Sativa* (Alfalfa) AGAINST DOXORUBICIN INDUCED CARDIOMYOPATHY

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Cardiomyopathy is an anatomic and pathologic diagnosis associated with muscles and electrical dysfunction of the heart. It may present breathlessness with activity or even at rest. Swelling of the legs, ankle, and feet, bloating of the abdomen due to fluid buildup, cough while lying down, heart beats that feel rapid, pounding or fluttering, chest discomfort or pressure. It can contribute to the development of various CVS Diseases such as heart failure, arrhythmia, vascular heart disease, and cardiac arrest. Numerous pathogenesis processes including oxidation and inflammation cause apoptosis and cardiac-cytosis which are also involved in the development of cardiovascular diseases. Doxorubicin, an anticancer drug, is used to induce cardiomyopathy by means of formation of ROS, apoptosis, fibrosis and altered the different signaling pathways. Traditionally *Medicago sativa* (Alfalfa) is also known as father of all food and is used for the treatment of arthritis, kidney problems, fever, as diuretic, anti-cancer, anti-rheumatic. Alfalfa also acts as an antioxidant, to reduce the oxidative stress and suppress the NF-KB pathway. In this review, we will discuss how alfalfa helps for the treatment of cardiomyopathy. which is a basic perennial herb that grows up to 91 cm high.

Keyword: *Medicago Sativa* (Alfalfa), Cardioprotective effect, Cardiomyopathy, ROS, Antioxidant effect.

HEALTHMEDICON/25/EPP-006

INVESTIGATING THE THERAPEUTIC EFFICACY OF RHYNCHOPHYLLINE IN STREPTOZOTOCIN-INDUCED DIABETES: MECHANISMS AND EFFECTIVENESS IN WISTAR ALBINO RATS

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Rhynchophylline, an alkaloid found in *Uncaria rhynchophylla*, has several pharmacological activities, including neuroprotection, anti-inflammation, and antidiabetic actions. This review investigates the efficacy of rhynchophylline in alleviating the consequences of streptozotocin (STZ)-induced diabetes in Wistar albino rats, a prevalent animal model for diabetes. STZ-induced diabetes is characterized by the loss of pancreatic β -cells, resulting in hyperglycemia, oxidative stress, and inflammation, making it an ideal model for assessing possible antidiabetic medicines. Rhynchophylline has been shown to modulate blood glucose levels, diminish oxidative stress, and enhance insulin sensitivity in diabetic animals. Rhynchophylline has shown these effects in several methods by controlling essential enzymes in glucose metabolism, attenuation of inflammatory cytokines, and increases of antioxidant defense systems. Furthermore, the neuroprotective attributes of rhynchophylline have been investigated, with indications that it mitigates cognitive deterioration and neuropathy linked to

diabetes. This review collected data from reported studies examining the effects of rhynchophylline on STZ-induced diabetes in Wistar albino rats, highlighting its potential as an efficacious therapeutic agent for addressing diabetes-related problems. Additionally, we review the fundamental mechanisms of action, including the regulation of inflammatory and oxidative stress pathways, and the potential of rhynchophylline to inhibit the advancement of diabetes-induced damage across many organ systems. Further study is required to elucidate the appropriate dose, long-term effectiveness, and safety profiles for the therapeutic use of rhynchophylline as a possible supplementary treatment for diabetes.

Keywords: Rhynchophylline, Streptozotocin, Diabetes, Oxidative stress, Inflammation

HEALTHMEDICON/25/EPP-007

INVESTIGATING THE PHARMACOLOGICAL VERSATILITY OF ETIDRONIC ACID: FROM BONE HEALTH TO HEPATOPROTECTION, INFLAMMATION, AND CANCER

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Etidronic acid, a bisphosphonate predominantly used to treat bone resorption diseases such as osteoporosis, has received attention for its novel pharmacological actions. This review aims to investigate Etidronic acid's larger pharmacological profile, emphasizing its effects on bone metabolism, new roles in liver protection, anti-inflammatory activities, and possible anticancer activities. Its principal function is to block osteoclast activity, reducing bone resorption and increasing bone mineral density. It also possesses hepatoprotective activities, with data showing that it may reduce liver damage in models of chemically induced hepatotoxicity. This hepatoprotective effect is related to its ability to modulate oxidative stress, suppress inflammatory cytokines, and reduce hepatic mineralization, all of which are prevalent processes involved in liver injury. Furthermore, it shows anti-inflammatory and anticancer properties. It decreases pro-inflammatory mediators including TNF- α and IL-6, which are key in chronic illnesses. Furthermore, its possible involvement in preventing tumor cell development and metastasis is receiving increasing attention, especially in the setting of bone metastases. This review summarizes current information on the pharmacological actions of Etidronic acid, emphasising its flexibility and potential for repurposing in various therapeutic fields. More studies are required to understand its mechanisms of action completely and determine its therapeutic use beyond bone problems.

Keywords: Etidronic acid, Pharmacological activities, Bisphosphonates, Hepatoprotective, Anti-inflammatory

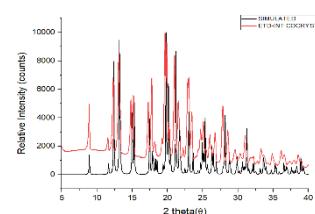
HEALTHMEDICON/25/EPP-008

**FORMULATION AND CHARACTERIZATION OF ETODOLAC-
ISONICOTINAMIDE COCRYSTAL GEL**

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Cocrystals are crystalline solids made up of two or more distinct molecules linked by nonionic and noncovalent bonds, one of which is the API, in a specific stoichiometric ratio within the same crystal lattice. Finding similar coformers that may enhance an active pharmaceutical ingredient's (API) physicochemical characteristics is the primary objective of cocrystal screening. The molecular arrangement within the crystal lattice of an API has significant effects on its physicochemical characteristics, such as solubility, permeability, dissolution rate, etc. Therefore, applying the concepts of crystal engineering to rationally modify the physicochemical characteristics of active pharmaceutical ingredients (APIs) can be assisted by an understanding of these interactions. Etodolac (ETD), BCS Class II drug which belongs to part of the pyranocarboxylic acid group of nonsteroidal anti-inflammatory agents, is the focus of the current research's cocrystal screening. In 1985, ETD gained its first medical approval; in 1991, the US FDA approved this under the Lodine® brand. ETD's prescribed daily dosage is 400 mg or 500 mg given twice daily, or 300 mg taken orally two to three times a day. Its high dose and frequent daily administration result in number of side effects, compromising patient convenience and compliance. To effectively treat pain locally, it could be possible to optimise a suitable solid form of ETD with enhanced physicochemical properties and then develop it as a topical gel. Etodolac-Isonicotinamide (ETD-INT) cocrystal was prepared by RCM (Reaction crystallization method). 560mg of ETD and 480mg of INT in 5ml Methanol and kept it on a water bath shaker for 7 hours and the sample was collected and examined by PXRD for any changes. The cocrystal was successfully prepared and characterised.



Keywords: Cocrystal, Etodolac, NSAIDS, RCM (Reaction crystallization method).

HEALTHMEDICON/25/EPP-009

INVESTIGATING THE PHARMACOLOGICAL EFFECT OF HENTRIACONTANE

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Hentricontane, a naturally occurring long-chain hydrocarbon -(C₃₁H₆₄), is well-known for its various pharmacological characteristics such as anti-inflammatory, antitumor, and antimicrobial activity. Hentricontane, also called untriacontane, is a solid, long-chain alkane hydrocarbon with the structural formula CH₃(CH₂)₂₉CH₃. It is the main component of paraffin wax. It is a natural product derived from plants, including beeswax and candelilla wax. Hentricontane has a range of functions, including as a natural colour, pigment, and antitubercular. Extracted from a variety of plant sources, it has remarkable medicinal potential. Hentricontane has been demonstrated to alter inflammatory pathways, hence alleviating inflammatory diseases. Furthermore, its cytotoxic and apoptosis-inducing capabilities against

specific cancer cell lines highlight its anticancer activity. The molecule has broad-spectrum antibacterial action, making it effective against both bacterial and fungal infections. These findings emphasise hentriaccontane's potential as a lead chemical for therapeutic development, calling for further exploration. Hentriaccontane is found in the roots of the ashwagandha plant. Hentriaccontane may decrease pro-inflammatory cytokines and liver inflammation, hence reducing hepatocellular damage. Hentriaccontane may have antioxidant properties that reduce oxidative stress, so protecting hepatic cells and keeping the liver operating normally.

Keyword: Hentriaccontane, pharmacological effect, Anti-inflammatory, Antioxidant

HEALTHMEDICON/25/EPP-010

**EXPLORING POSSIBLE TGFBR1 INHIBITORS FOR CANCER TREATMENT
USING MOLECULAR DYNAMICS SIMULATIONS AND STRUCTURE-BASED
VIRTUAL SCREENING**

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One of the most prevalent causes of death worldwide is cancer and the major issue in its treatment is resistance to traditional drugs like radiation and chemotherapy. Therefore, finding novel therapeutic drugs should be the top priority. A crucial regulatory cytokine that has a major impact on cellular functions, transforming growth factor- β is especially important for promoting and regulating cell division. As the most potential active location of TGF- β signalling, TGF- β receptor 1 is a powerful drug target that has attracted much interest in developing novel anticancer drugs. Therefore, the possible natural products such as TGF β R1 inhibitors are investigated in this study. To identify a molecule with high binding potential, the natural product database was screened using the SB431542 complexed TGF β R1 protein model. With a docking score of 17.54 kcal/mol, NPC247629 has the highest affinity for the TGF β R1 and is the best-scoring compound out of all those examined. All suggested hits are kept inside the receptor in dynamic states, according to the all-atoms MD simulation study. The binding mechanism of top-hit natural compounds was further investigated using principal components and free energy landscape assessment. With their strong binding affinity and enormous potential for TGF β R1 inhibition, the top screened hits, NPC247629 and NPC60735, are opening the door for fascinating new research in cancer treatment.

Keywords: Virtual screening, natural product database, TGF β R1, Molecular dynamic simulation, Pharmacokinetics.

HEALTHMEDICON/25/EPP-011

OPTIMIZATION DESIGN AND PREPARATION PODOPHYLLOTOXIN LOADED-FOLIC ACID BIOFUNCTIONALIZED METAL-ORGANIC- FRAMEWORK FOR LUNG CANCER THERAPY: CHARACTERIZATION AND BIODISTRIBUTION STUDIES

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The aryltetralin lignan podophyllotoxin has cellular functions in cancer cells by binding to enzymes that are necessary for DNA replication and inhibiting podophyllotoxin mediated transcription. The folic acid functionalized metal organic framework (MOF) was prepared using 5-steps method, i.e., vapor diffusion of potassium hydroxide (KOH) and gamma cyclodextrin (γ -CD) to prepare γ -CD-MOF (CDF); polymerization of CDF; biofunctionalization of CDF with folic acid (FA-CDF). Then podophyllotoxin impregnated FA-CDF nanoparticles was synthesized. The refined formulation was investigated using several techniques like SEM, TEM, DSC, FTIR, ^1H NMR, drug release and stability tests. The refined product had a particle dimension of 202.34 ± 4.31 nm, zeta potential of -22.51 ± 0.90 mV, PDI of 0.2637 ± 0.10 , an entrapment efficiency of $79.16 \pm 1.2\%$, and loading of $13.58 \pm 1.0\%$. It also showed good storage stability at ambient temperature and 4°C at $60 \pm 5\%$ RH. The FA-CDF-Podophyllotoxin formulation has sustained drug release over extended period. The hemolytic assay confirmed hemocompatibility and safer for administration. FA-CDF-Podophyllotoxin diminished viable cells to $36.5215 \pm 2.5138\%$ in A549 cells with IC_{50} value of $6.294 \mu\text{M}$. The FA-CDF-Podophyllotoxin showed anti-inflammatory and antioxidant effect and their IC_{50} value were 25.07 ± 0.34 and $85.07 \pm 1.42 \mu\text{g/mL}$. The biodistribution analysis revealed a higher concentration of FA-CDF-Podophyllotoxin in the lung tissues. The findings suggest that the novel FA-CDF-Podophyllotoxin has potential therapeutic application in NSCLC.

Keywords: Metal Organic Framework, γ -cyclodextrin, Lung cancer, Podophyllotoxin, Box-Behnken Design, Drug Delivery, Biodistribution

HEALTHMEDICON/25/EPP-012

SYNTHESIS OF FOLIC ACID AND LOW MOLECULAR WEIGHT HEPARIN BIOFUNCTIONALIZED MODIFIED Γ -CYCLODEXTRIN METAL-ORGANIC FRAMEWORK ENTRAPPED PODOPHYLLOTOXIN AND ITS ANTIOXIDANT ACTIVITY

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Podophyllotoxin (PDX), a bioactive aryltetraline lignin, was isolated from the roots of the *Podophyllum emodi* Wall. The column chromatographic separation and purification technique was used to isolate podophyllotoxin from resin Podophyllin. To achieve maximum purity, silica gel chromatography aids in the removal of unnecessary polyphenolic contaminants. The isolated PDX was characterized elucidated using extensive spectral analysis, including ^1H , and ^{13}C NMR. Podophyllotoxin and its many derivatives and congeners are broad-spectrum pharmacologically active substances. In this present study, a modified cyclodextrin metal-

organic framework coupled with folic acid and Low molecular weight heparin (LMWH) was synthesized using following steps methods: firstly, vapor diffusion of potassium hydroxide (KOH) and gamma cyclodextrin (γ -CD) to prepare γ -CD-MOF (CDF), secondly-polymerization of CDF, thirdly- biofunctionalization of CDF with folic acid (FA-CDF), fourthly- preparation of the LMWH-Cystamine Complex (LMWH-Cys). At first, FA-CDF-LMWH nanoparticle was prepared using FA-CDF and LMWH-Cys, and then the PDX impregnated FA-CDF-LMWH nanoparticle (PDX-FA-CDF-LMWH) was synthesized. The particle size of the PDX-FA-CDF-LMWH was found to be in the range of 223.45-278nm. The drug release % was 81.23 % in 72h. Then, the comparative DPPH antioxidant assay of PDX and PDX-FA-CDF-LMWH results suggests that the PDX-FA-CDF-LMWH has better antioxidant IC₅₀ value (219.53 μ g/mL) as compared to PDX (401.75 μ g/mL). This may help for the treatment of anti-inflammatory or cancer diseases through targeting folate receptors.

Keywords: Podophyllotoxin; Cyclodextrin; Folic acid; LMWH; Antioxidant

HEALTHMEDICON/25/EPP-013

INVESTIGATION OF PROTECTIVE EFFECT OF WALNUT OIL AGAINST EXPERIMENTALLY INDUCED ISCHEMIC STROKE IN RAT

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A stroke occurs when blood flow to the brain is disrupted, either by a clot (ischemic stroke) or a ruptured blood vessel (hemorrhagic stroke), resulting in significant mortality, disability, and brain injury. This study investigates the neuroprotective and oxidative stress-reducing properties of walnut oil (WO) in reversing global cerebral ischemia induced by bilateral common carotid artery occlusion (BCCAO) in rats. Rats were divided into five groups (six per group): SHAM (normal saline, no surgery), BCCAO (saline, followed by BCCAO), WO low dose (20 mg/kg/day), WO high dose (40 mg/kg/day), and melatonin (30 mg/kg/day). Treatments were given orally for 15 days, followed by BCCAO surgery, 17 minutes of ischemia, and 24 hours of reperfusion. In the BCCAO group, infarct area and neurological deficits significantly increased, alongside elevated lipid peroxidation and reduced glutathione (GSH) levels. These effects were mitigated by WO (both doses) and melatonin, which normalized biomarkers, reduced infarct size, and improved neurological scores. Motor and sensory impairments, as indicated by increased walking initiation time and reduced performance in Rota rod and elevated plus maze tests, were significantly restored with WO and melatonin treatments. The findings suggest that WO exhibits significant neuroprotective effects by reducing oxidative stress, improving sensory-motor functions, and minimizing ischemic stroke symptoms. This positions walnut oil as a promising natural therapy for preventing and managing brain stroke.

Keywords: Ischemia, Walnut Oil, stroke, oxidative stress

HEALTHMEDICON/25/EPP-014

**IN VIVO REDUCTION OF SKIN INFLAMMATION AND ATOPIC DERMATITIS
USING FERULIC ACID LOADED NIOSOMAL GEL**

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The quality of life is considerably difficult for those who have atopic dermatitis (AD), a chronic inflammatory skin disease marked by swelling, redness, and itching. The frequent adverse effects of the current medications, such as immunosuppressants and corticosteroids highlight the need for safer and more efficient substitutes. The ferulic acid was isolated from the ethanolic extract of fruits of *Prosopis cineraria*. The chemical structure of the isolated ferulic acid was elucidated by infra-red spectroscopy (IR), ¹H NMR and ¹³C NMR. This study investigates the therapeutic potential of ferulic acid (FA), a material having anti-inflammatory and antioxidant properties, when given as a niosomal gel to treat skin inflammation like AD. Niosomes, as vesicular carriers, enhance the stability, skin penetration, and bioavailability of encapsulated drugs. To examine the efficacy of the niosomal gel, six groups of mice were used: the normal control group (NC), the DNCB group, and the group treated with a niosomal gel loaded with ferulic acid at varied amounts. Significant outcome indicators were the severity of dermatitis, histological changes, and skin concentrations of inflammatory cytokines. The findings suggest that FA-loaded niosomal gel offers a promising new therapeutic approach to treating atopic dermatitis, with enhanced drug delivery and sustained anti-inflammatory effects.

Keywords: Atopic dermatitis; Ferulic acid; Niosomal gel; Inflammatory cytokines

HEALTHMEDICON/25/EPP-015

**IN VIVO REDUCTION OF SKIN INFLAMMATION AND ATOPIC DERMATITIS
USING FERULIC ACID LOADED NIOSOMAL GEL**

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The quality of life is considerably difficult for those who have atopic dermatitis (AD), a chronic inflammatory skin disease marked by swelling, redness, and itching. The frequent adverse effects of the current medications, such as immunosuppressants and corticosteroids highlight the need for safer and more efficient substitutes. The ferulic acid was isolated from the ethanolic extract of fruits of *Prosopis cineraria*. The chemical structure of the isolated ferulic acid was elucidated by infra-red spectroscopy (IR), ¹H NMR and ¹³C NMR. This study investigates the therapeutic potential of ferulic acid (FA), a material having anti-inflammatory

and antioxidant properties, when given as a niosomal gel to treat skin inflammation similar to AD. Niosomes, as vesicular carriers, enhance the stability, skin penetration, and bioavailability of encapsulated drugs. To examine the efficacy of the niosomal gel, six groups of mice were used: the normal control group (NC), the DNCB group, and the group treated with a niosomal gel loaded with ferulic acid at varied amounts. Significant outcome indicators were the severity of dermatitis, histological changes, and skin concentrations of inflammatory cytokines. The findings suggest that FA-loaded niosomal gel offers a promising new therapeutic approach to treating atopic dermatitis, with enhanced drug delivery and sustained anti-inflammatory effects.

Keywords: Atopic dermatitis, Ferulic acid, Niosomal gel, Inflammatory cytokines

HEALTHMEDICON/25/EPP-016

FORMULATION AND EVALUATION OF FLOATING TABLETS OF NANOPRECIPITATED FUROSEMIDE

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This study aims to develop and optimize floating tablets of Furosemide, a loop diuretic with limited bioavailability due to its narrow absorption window in the upper gastrointestinal tract. The primary objective is to formulate a gastro-retentive drug delivery system (GRDDS) to enhance the drug's therapeutic efficacy and improve patient compliance of nano precipitated Drug. Nano Precipitation provides nano-sized crystallised molecules with enhanced solubility and purity of drugs. Floating tablets will be prepared using the direct compression method, incorporating hydroxypropyl methylcellulose (HPMC) as the matrix-forming polymer and sodium bicarbonate as the gas-generating agent. A 3^2 factorial design will be applied to optimize the formulation by varying the concentrations of the polymer and gas-generating agent. The evaluation parameters will include buoyancy lag time, total floating time, and the drug release profile, which will be assessed through in-vitro studies. Post-formulation evaluations such as hardness, friability, weight variation, and floating properties will be conducted. The drug release behaviour will be studied to determine the release kinetics, with the aim of achieving sustained release for improved bioavailability and prolonged gastric retention. This study will provide insights into the development of floating Furosemide tablets as a potential strategy for improving drug efficacy and patient adherence. Further optimization and in-vitro characterization will be performed to finalize the formulation and assess its potential for clinical application.

Keywords: Nano crystallisation, Furosemide, floating tablets, gastro-retentive drug delivery system (GRDDS), sustained release, factorial design.

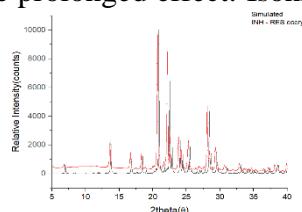
HEALTHMEDICON/25/EPP-017

DEVELOPMENT OF ISONIAZID-RESVERATROL CO-CRYSTAL GEL FOR TOPICAL TREATMENT OF CUTANEOUS TUBERCULOSIS

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The skin-affecting type of tuberculosis, termed cutaneous tuberculosis (CTB), usually appears as persistent, ulcerative sores. However, oral anti-tuberculosis medications such as isoniazid (INZ) are effective when used systemically; a range of side effects restricts their absorption. An alternative to oral therapy might involve topical formulations that deliver drugs directly to the skin. Currently, no topical treatment is available for CTB; whereas conventional therapy has generally shown positive results, alternative treatment approaches are rare. Cocrystallization is an approach that modulates the crystal packing of a crystalline form by combining two or more active substances, altering its physicochemical characteristics. Because of their ease of application, continuous-release, and reduced risk of systemic side effects, isoniazid-resveratrol (INZ-RES) cocrystals have been incorporated into gel formulations for local treatment. The purpose of the current study, with its potential to significantly impact CTB treatment, is to make the isoniazid less soluble to achieve a more prolonged effect. Isoniazid-Resveratrol (INZ-RES) cocrystal was prepared by RCM (Reaction crystallization method). 50mg of INZ and 104mg of RES in 2ml Methanol were kept on a magnetic stirrer at 200rpm for 6 hours, and the sample was collected and examined by PXRD for any changes. The cocrystal was successfully prepared and characterised.



Keywords: Cocrystal, Isoniazid, Resveratrol, Cutaneous tuberculosis, Reaction crystallization method (RCM).

HEALTHMEDICON/25/EPP-018

ISOLATION AND CHARACTERIZATION OF HARMALINE FROM *Peganum harmala* AND ITS PREFORMULATION STUDIES FOR THE MANAGEMENT OF ALZHEIMER DISEASE

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Peganum harmala L. is a perennial glabrous plant that is indigenous to the eastern Mediterranean region and grows naturally in semi-arid environments, steppe regions, and sandy soils. For many years, seeds, fruits, roots, and bark of *P. harmala* have been utilized as traditional medicines in India and other countries. Harmaline, β-carboline alkaloid, was isolated from the seed extract of *P. harmala* and characterized by ¹H, ¹³C NMR and mass spectral analysis. The dried powdered seeds are used for the extraction following cold maceration technique using DCM and methanol in a ration of 1:1 proportion. The extract was further fractionated using petroleum ether, chloroform and methanol. Harmaline was isolated from the methanolic fraction by column chromatography. Considering its wide range of pharmacological activities, the preformulation studies of harmaline was performed to investigate the effects against Alzheimer disease.

Keywords: Harmaline; *Peganum harmala*; Spectroscopy; Alzheimer disease; Preformulation studies

HEALTHMEDICON/25/EPP-019

**THE RHEOLOGICAL PROPERTIES OF *Tamarindus Indica* POLYSACCHARIDE:
APPLICATIONS IN PHARMACEUTICAL AND FOOD INDUSTRIES**

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The polysaccharides (TSP) from Tamarind seeds (*Tamarindus indica*) have been reported as multifunctional excipients in pharmaceutical formulations; however, their rheological behaviour is not yet reported. In this study, an attempt has been made to evaluate the rheological behaviour of the isolated polysaccharide to establish its suitability as a pharmaceutical excipient. The rheological properties of polysaccharide were evaluated using Brookfield R/S Plus Rheometer. The non-Newtonian index values were determined from the log-log plots of shear stress vs shear rate (down curve). The effects of polymer concentration, polymer particle size, solution pH, type of electrolytes, preservatives, duration of heating, temperature, and moist heat sterilization on rheological behaviour were determined. Additionally, the yield value and thixotropic coefficient for different concentrations of the polymer were determined. The polysaccharide exhibited concentration dependent pseudoplastic flow. The non-Newtonian index values were found to be above 1, indicating a pseudoplastic flow behaviour. Both the pseudoplastic index and the pseudoplastic viscosity exhibited a linear relationship with concentration of polysaccharide. The polysaccharide dispersions of particles of 120 mesh exhibited better pseudoplastic behaviour compared to the particles of 60 mesh. The viscosity was found to be maximum at pH 2, which suggests that the polysaccharide undergoes optimum hydration at this pH value. When treated with different electrolytes, the viscosity of the polysaccharide solutions was found to decrease in the order of $KCl < NaCl < CaCl_2 < ZnCl_2 < FeCl_3$, which was consistent with the Hofmeister rank order. The presence of a preservative, methyl paraben, did not have any effect on the viscosity of TSP polysaccharide solutions. It is, therefore, concluded that methyl paraben can be used as an effective preservative in the preparations containing TSP polysaccharide. The viscosity of polysaccharide was found to decrease with an increase in duration of heating from 1 to 4 hours, which is attributed to the depolymerization. It was observed that the viscosity of polysaccharide decreased with an increase in temperature. The activation energy of TSP polysaccharide was high, indicating higher resistance to flow. TSP was found to be resistant to autoclaving and, therefore, can be effectively used in the sterile dosage forms.

Keywords: TSP polysaccharide, pseudoplastic flow, non-Newtonian flow, thixotropy, rheology, *Tamarindus indica*

HEALTHMEDICON/25/EPP-020

ISOLATION AND CHARACTERIZATION OF URSOLIC ACID FROM *Lavandula angustifolia* AND ITS ALPHA-AMYLASE INHIBITORY POTENTIAL

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Ursolic acid (UA), a pentacyclic triterpenoid, was isolated from the biomass marc of the *Lavandula angustifolia* extract and characterized by ^1H , ^{13}C NMR and HRESI-MS analysis. The lavender marc was obtained (after hydro-distillation) and extracted with DCM following the cold maceration technique. This process was repeated three times. The decanted solvent was concentrated using rota-vapor with reduced pressure at 45°C. Column chromatography with a 20% EtOAc:Hexane mobile phase was used to purify UA. The Rf value was 0.5 when TLC was run in 30% EtOAc:Hexane. Despite being a UV-inactive substance, UA exhibits a pink spot on TLC following charring with the p-anisaldehyde sulphuric acid reagent. The present work identified UA had strong *in vitro* alpha-amylase inhibitory activity with $\text{IC}_{50} = 0.041 \pm 0.216 \mu\text{g/ml}$, suggesting that it could be used as an anti-diabetic medication.

Keywords: Ursolic acid; *Lavandula angustifolia*; Spectroscopy; Triterpenoid; alpha amylase inhibitor

HEALTHMEDICON/25/EPP-021

**INNOVATIVE DRUG DELIVERY SYSTEMS IN ISCHEMIC STROKE:
OVERCOMING BARRIERS AND ENHANCING THERAPEUTIC EFFICACY**

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As a major cause of disability and death around the globe, Ischemic brain stroke presents a significant challenge for healthcare systems. A mix of complex failure mechanisms such as neuronal death, inflammation, and oxidative stress, which occurs when blood vessels are interrupted, serves as reasons for this. It is true that the outcomes of strokes have improved drastically due to surgical interventions like thrombolysis and thrombectomy, but the issue of lack of long-term treatment plans remains. Recently developed technologies in drug discovery and development of new dosage forms offer new hope. Innovative techniques such as nanocarriers, liposomes, and microneedles can improve both the delivery and efficacy of neuroprotective agents, anti-inflammatory, and thrombolytic drugs by targeting ischemic regions of the brain. In addition, researchers have slowly been discovering new drugs using high-throughput screening paired with advanced molecular modelling that hinders pathophysiological processes like inflammation and oxidative damage. The rise of new biomaterial-based delivery systems, including brain-targeted nanoparticles and hydrogel implants that can increase drug bioavailability and decrease systemic toxicity, provide more efficient and safer options. The potential for continuous drug delivery related to poststroke neuroprotection and recovery needs also calls for the use of biomaterials and controlled release

systems. This document examines the latest developments in drug delivery technologies on stroke ischemia, which exploits advanced mechanisms of BBB penetration, enhanced drug pharmacokinetics, and other outcome related improvements. Further advances might improve the overall clinical and preclinical treatment methods of ischemic stroke and change the existing treatment paradigm.

Keywords: Ischemic stroke, Thrombolysis, Thrombectomy, BBB

HEALTHMEDICON/25/EPP-022

**NANOTECHNOLOGY IN DRUG DISCOVERY: UTILIZING ADVANCED
TECHNIQUES FOR DRUG DEVELOPMENT, DELIVERY, AND DISEASE
MANAGEMENT**

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Through new innovative techniques in developing, administering, and managing diseases, nanotechnology has emerged as an instrument of revolutionary change in modern pharmaceutical research. Critical importance of nanotechnology has been highlighted for the transformation of drug research and therapeutic options through this poster. Drugs are developed in a better way by integrating nanomaterials and nanocarriers within the drug development framework, which ensures effective therapy with minimal side effects. Advanced methodologies, thereby, identify innovative drug candidates with significantly high efficiency due to the large-scale applications of nanomaterials and the screening of drugs based on nanostructures. Those delivery systems, wherein nanotechnology such as dendrimers, liposomes, or nanoparticles are made use of lead to controlled as well as sustainable release, eventually improving the clinical outcome. Disease management is one area of relevance where nanotechnology plays an important role with the help of nanodiagnostics. Nanodiagnostics can ensure that many infections, cancers, and cardiovascular diseases are diagnosed early and, hence, undergo personalized therapies. Safety, toxicity, and regulatory issues regarding nanoparticles prevail, and many research along with caution are to be noted. Future developments in nanotechnology are likely to catalyze more significant developments in drug discovery, thereby opening the floodgates for research into more personalized, effective, and targeted medical treatment. This poster points to the prospect of improving disease management strategies and even the processes of medication discovery, which could well be the disruptive change within healthcare.

Keywords: Nanodiagnostics, Nanotechnology, Dendrimers, Cancer, nanomaterials, drug discovery

HEALTHMEDICON/25/EPP-023

ISOLATION, CHARACTERIZATION OF DIOSGENIN FROM *Trigonella foenum-graecum* AND ITS FORMULATION FOR THE TREATMENT OF WOUND IN TYPE -2 DIABETIC RATS

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One of the most common naturally occurring compounds in the class of steroid saponins is diosgenin, often referred to as 25R-spirost-5-en-3 β -ol. It has generated a lot of interest in the medical community due to its numerous pharmacological properties and potential for a wide range of health-promoting benefits. The compound Diosgenin was isolated from the seed extract of *Trigonella foenum-graecum* using organic solvents DCM/ MeOH in a proportion of 1:1 and characterized through ^1H , ^{13}C NMR, and HRESI-MS spectral analysis. In this present study, the hydrogen formulation of Diosgenin was prepared and characterization was done by SEM, and FTIR spectral analysis. Before diabetic wound, skin irritation was performed, and it was observed that no irritation was found at different time intervals. The diabetic wound healing was evaluated in the streptozotocin nicotinamide model. E2 and F5 formulations showed the maximum potential in wound healing. The overall study resulted hydrogel formulation of diosgenin can be used for the treatment of wound in Type -2 diabetic rats.

Keywords: Diosgenin; *Trigonella foenum-graecum*; Spectroscopy; Saponin; Diabetic wound

HEALTHMEDICON/25/EPP-024

DEVELOPMENT AND VALIDATION OF RP-HPLC METHOD FOR SIMULTANEOUS ESTIMATION OF POLYTHIAZIDE AND VALSARTAN

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A simple, specific, accurate, precise and solution stability by HPLC method for the simultaneous determination of the antihypertensive drug combination consisting of Valsartan (VAL) and Polythiazide (PTZ) was developed and validated. The optimized conditions for the separation of the two analytes consisted of a Kromasil C-8, 5 μm (150 \times 4.6) mm or equivalent column. For mobile phase A, 2.0 g of ammonium dihydrogen phosphate was dissolved in water and diluted with water to make 1000 ml. Similarly, mobile Phase B is a mixture of methanol and acetonitrile in the ratio of 50:50. The column temperature was maintained at ambient with mobile phase flow rate 1.2 mL/ min and injection volume was 10 μl . The precision of the method was measured through adequate repeatability or intraday precision ($\text{RSD} \leq 2\%$). The method demonstrated adequate linearity over the range of 0.5-250%. The method also demonstrated sufficient robustness to variations in mobile phase, pH, column temperature, and flow rate. The full recoveries of each working standard for all compounds were within ICH specifications (98-101%). The developed method is rapid (run time 10 min), selective, requires simple sample preparation procedures and simple mobile phase combinations. It is also cost effective and represents a good procedure for the determination of VAL and PT in raw materials and pharmaceutical dosage form.

Keywords: Valsartan and Polythiazide, RP-HPLC, Column, Acetonitrile, methanol

HEALTHMEDICON/25/EPP-025

DEVELOPMENT AND EVALUATION OF NANO EMULSION GEL LOADED WITH HERBAL DRUG FOR ANTI DIABETIC ACTIVITY

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Development and evaluation of a novel nano emulsion gel formulation containing a herbal drug with potential antidiabetic properties. The objective was to enhance the drug's bioavailability, improve patient compliance, and achieve sustained drug release. Nano emulsions were fabricated using a suitable combination of oils, surfactants, and co-surfactants, characterized for particle size, polydispersity index, and zeta potential. The optimized nano emulsion was then incorporated into a hydrogel matrix to provide a convenient and patient-friendly dosage form. Diabetes mellitus is a metabolic disorder characterized by high blood glucose levels, affecting millions worldwide. Conventional treatments often have limited efficacy and adverse effects, prompting the search for alternative therapies. Herbal drugs, rich in bioactive compounds, offer a promising solution. However, their poor solubility and bioavailability hinder their therapeutic potential. Nano emulsion gels are developed by incorporating herbal drugs into a nano emulsion system, which is then gelled using a suitable gelling agent. This formulation enhances the solubility and bioavailability of herbal drugs, allowing for improved topical delivery. The results demonstrated promising characteristics, including sustained drug release, enhanced skin permeation, and significant antidiabetic activity. This research provides a valuable platform for the development of effective and innovative herbal drug delivery systems for the management of diabetes.

Keywords: Herbal Drug, Anti Diabetic, Poor Bioavailability, Nano emulsion.

HEALTHMEDICON/25/EPP-026

IMPACT OF PROPRIOCEPTIVE NEUROMUSCULAR FACILITATION TRAINING ON ENHANCING RESPIRATORY FUNCTION: A PUBLIC HEALTH PERSPECTIVE

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This review synthesizes current research on the effectiveness of proprioceptive neuromuscular facilitation (PNF) techniques and breathing exercises in enhancing pulmonary function, respiratory parameters, and related health outcomes in both healthy individuals and those with

respiratory conditions. Evidence indicates that PNF respiration exercises improve expiratory reserve volume and vital capacity in healthy adults. Specific techniques, including intercostal stretches, improve chest expansion, decrease respiratory rate, and increase peak expiratory flow rate in patients with chronic obstructive pulmonary disease. In mechanically ventilated patients, PNF combined with chest physiotherapy has better results in oxygen saturation, pulmonary compliance, and decreases in heart and respiratory rates compared to chest physiotherapy alone. Intercostal stretches and anterior basal lifts also improve oxygen saturation in patients with COVID-19. In COPD populations, the integration of PNF stretching with aerobic training improves neck and shoulder mobility and pulmonary function. Though PNF interventions are usually reported to have beneficial effects, certain populations show significant limitations. In the case of Parkinson's disease, the benefits seem to be rather modest. Some studies show methodological quality issues and limited data availability. In general, PNF techniques and breathing exercises are promising interventions for improving respiratory health, but further research is needed to determine optimal protocols and to evaluate their effects on muscular strength and long-term outcomes. This review underscores the potential of PNF as a valuable tool in public health strategies for respiratory rehabilitation.

Keywords: Proprioceptive Neuromuscular Facilitation (PNF), Breathing Exercises, Pulmonary Function, Respiratory Rehabilitation, Mechanical Ventilation, Intercostal stretches, Public Health.

HEALTHMEDICON/25/EPP-027

DEVELOPMENT AND EVALUATION OF NANOGL OF ITRACONAZOLE FOR ANTIFUNGAL EFFICACY

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Itraconazole is a triazole antifungal category drug used for the treatment of local & Systemic fungal infections. Itraconazole is not recommended to neutropenic and other immune-compromised patients who have difficulty swallowing the oral capsule formulation, and it has many side effects. The present study focuses on the development and evaluation of a nanogel formulation of Itraconazole an antifungal agent, to enhance its therapeutic efficacy and skin permeation for the treatment of fungal infections. Itraconazole a broad-spectrum antifungal drug, suffers from poor water solubility and limited bioavailability which can hinder its effectiveness and uses. To address the challenges a nanogel-based delivery system was formulated using a combination of polymeric and surfactant-based approaches to ensure optimal drug encapsulation and controlled release.

Methods: The prepared nanogel was characterized for particle size, polydispersity index (PDI), Zeta potential, drug entrapment efficiency, pH and rheological properties. In vitro drug release studies revealed a sustained and enhanced release profile compared to conventional gel formulation. Ex vivo skin permeation studies demonstrated improved permeation and retention of Itraconazole within the epidermis and dermis. Antifungal efficacy was assessed against *Candida albicans* and *Aspergillus niger*, showing superior inhibition zones and MIC values for the nanogel formulation.

Results: The Itraconazole nanogel offered a promising platform for improving antifungal therapy through enhanced drug delivery, better skin permeation and retention, and reduced side effects. This innovative formulation could potentially overcome the limitations of existing

topical antifungal therapies, providing a more effective treatment option for superficial and deep fungal infections.

Keywords: Itraconazole, Nanoemulsion, Antifungal, Nanogel, Candidiasis

HEALTHMEDICON/25/EPP-028

BRUTON TYROSINE KINASE INHIBITORS-BASED FORMULATIONS FOR MANAGEMENT OF CHRONIC LYMPHOCYTIC LEUKEMIA

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Bruton tyrosine kinase (BTK) inhibitors are a class of targeted therapeutic agents designed to selectively inhibit the BTK enzyme, a critical component of B-cell receptor signaling pathways involved in the pathogenesis of B-cell malignancies, have become essential treatments for chronic lymphocytic leukemia (CLL). The clinical efficacy and safety of these inhibitors, which include ibrutinib, acalabrutinib, and zanubrutinib, may be limited by their formulation issues, which include poor water solubility, low bioavailability, and unpredictable absorption. To address these challenges, novel formulation techniques that aim for improved solubility, stability, and patient adherence have been developed. Developments in pharmaceutical formulations, such as solid dispersion systems, lipid-based delivery systems, and nanoformulations have enhanced the solubility and absorption of BTK inhibitors. This study focuses on current developments in BTK inhibitor formulations, including the use of nanotechnology-based methods such liposomes, micelles, and nanoparticles, which have improved pharmacokinetic parameters and targeted delivery while lowering off-target toxicities. Fixed-dose combinations and sophisticated oral dosage forms have also been essential in streamlining treatment plans and enhancing patient adherence. The study emphasizes the possibility of additional BTK inhibitor modification to improve their function for CLL therapy.

Keywords: Bruton tyrosine kinase, Zanubrutinib, Nanoformulations, Chronic Lymphocytic Leukemia

HEALTHMEDICON/25/EPP-029

PRE-COLUMN DERIVATIZATION AND UPLC-MS/MS BASED METHOD DEVELOPMENT OF GEMCITABINE IN REVERSE PHASE COLUMN FOR BIOANALYTICAL AND PHARMACEUTICAL APPLICATION

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Gemcitabine is a leading anticancer drug approved by FDA, it is used in treating variety of cancer either alone or along with other anti-cancer medications. However, the therapeutic efficacy of the drug is greatly compromised due to its poor pharmacokinetics and instability in biological samples, creating the need of developing fast, accurate and responsive bioanalytical method for its detailed monitoring. Present research aims at developing a UPLC-MS/MS technique coupled with pre-column derivatization for gemcitabine and validating it for its applicability, responsiveness and quantifiability for different types of bioanalytical and pharmaceutical applications. The method comprises of derivatization of gemcitabine with 9-

fluorenylmethyloxycarbonyl chloride (Fmoc-Cl) and N-(9-fluorenylmethoxycarbonyloxy) succinimide (Fmoc-OSu) for better retention of analyte and improving the chromatographic separation. The internal standard utilised for this purpose is Indomethacin. The formed derivatives have been separated on the Aquity UPLC BEH C18 reverse-phase column (2.1×100 mm, 1.7 \AA) by employing the linear gradient elution. This technique was checked over the concentration range of 3.9-2000 ng/mL in line with the ICH M10 guidelines. The obtained validation results demonstrate that the formed technique is simple, precise, rugged, accurate, and promising for the assessment of gemcitabine in various bioanalytical applications. This technique supports automatization and allows for high degree of analysis due to its small sample requirement ($10 \mu\text{L}$) and run time of 8 min.

Keywords: Gemcitabine, pre-column derivatization, Fmoc-Cl, LC-MS/MS, C₁₈ column

HEALTHMEDICON/25/EPP-030

DEVELOPMENT AND EVALUATION OF POLYMERIC NANOPARTICLES OF EPROSARTAN MESYLATE IN THE MANAGEMENT OF HYPERTENSION

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The development of novel drug delivery systems is a key focus in pharmaceutical research. The present work aims to develop and assess polymeric nanoparticles (PNPs) of Eprosartan mesylate for efficient control of hypertension. Poor solubility and significant first-pass metabolism of Eprosartan mesylate, an angiotensin II receptor antagonist, having limited bioavailability. By means of a biodegradable polymer, polymeric nanoparticles were developed to bypass these constraints, therefore facilitating better therapeutic efficacy and drug delivery. The nanoparticles were synthesized using the Nan precipitation technique using polymeric carrier. The formulations were refined and optimised according to particle size, polydispersity index, encapsulation efficiency, and drug-loading capacity. Characterization methods include dynamic light scattering (DLS), scanning electron microscopy (SEM), and Fourier-transform infrared spectroscopy (FTIR). Drug entrapment efficiency and *in vitro* drug release studies were performed to evaluate the potential of the nanoemulsion gels as effective carriers. The formulation exhibiting the most desirable physicochemical properties was further subjected to stability studies and ex-vivo permeation analysis. *In vitro* drug release studies demonstrated a sustained and controlled release profile over 24 hours, reducing the frequency of dosing and enhancing patient compliance. Furthermore, *in vivo* antihypertensive efficacy studies demonstrated superior blood pressure control with the nanoparticle formulation. This study highlights the potential of Eprosartan Mesylate-loaded polymeric nanoparticles as a promising drug delivery system for the efficient and sustained management of hypertension, offering improved pharmacokinetics, enhanced therapeutic outcomes, and better patient adherence.

Keywords: Nanotechnology, Nanoparticles, Eprosartan, Hypertension.

HEALTHMEDICON/25/EPP-031

DEVELOPMENT AND EVALUATION OF POLYMERIC NANOPARTICLES OF HERBAL BIOMARKER FOR MANAGEMENT OF HYPERTENSION

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Over the past few decades, there has been a significant interest in particulate delivery systems, specifically nanoparticles, which have been used to improve the pharmacokinetic and pharmacodynamic properties of various drug molecules. Nanoparticles, ranging from 1 to 100nm in size, are used in various industries, including electronics, magnetics, pharmaceuticals, cosmetics, energy catalysis, and materials. They exhibit enhanced properties like high reactivity, strength, surface area, sensitivity, and stability due to their small size. The necessary physicochemical properties and drug-polymer compatibility were confirmed by characterization techniques such as dynamic light scattering (DLS), scanning electron microscopy (SEM), and Fourier-transform infrared spectroscopy (FTIR). Studies on in-vitro drug release and drug entrapment efficiency were conducted to assess the nanoemulsion gels' potential as efficient carriers. Ex-vivo permeation analysis and stability experiments were performed on the formulation that showed the best physicochemical characteristics. The study highlights the potential of Biomarker loaded polymeric nanoparticles as a promising drug delivery technology for long-term hypertension control, demonstrating a steady, regulated release profile over a 24-hour period, reducing dosage frequency and improving patient adherence, thereby enhancing therapeutic outcomes.

Keywords: Nanoparticles, Biomarker, Hypertension

HEALTHMEDICON/25/EPP-032

NETWORK PHARMACOLOGY AND MOLECULAR INTERACTION ANALYSIS OF P-COUMARIC ACID DERIVATIVES FOR ANTIULCER THERAPY

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Peptic ulcer disease (PUD) is a widespread global health concern, often attributed to Helicobacter pylori infection and the use of nonsteroidal anti-inflammatory drugs (NSAIDs), resulting in considerable morbidity. Although current treatments, such as proton pump inhibitors (PPIs), are effective, they are associated with limitations including side effects, drug resistance, and incomplete healing. P-Coumaric acid, a phenolic compound with potent antioxidant, anti-inflammatory, and cytoprotective properties, has shown promise as a potential therapeutic agent for PUD management. This study explores the gastroprotective potential of p-Coumaric acid by examining its effects on mucosal integrity, ulcer reduction, and healing mechanisms. Key experimental approaches included identifying target genes of p-Coumaric acid through databases such as SwissTargetPrediction and STRING, combined with functional enrichment analyses to investigate associated biological pathways. A Venn diagram approach was employed to identify overlapping genes linked to both p-Coumaric acid and PUD. Protein-protein interaction (PPI) network analyses revealed six core genes: ALOX5, MMP2, ERBB2, PTGS1, EGFR, and PTGS2. Functional assays demonstrated p-Coumaric acid's ability to reduce oxidative stress and protect the gastric mucosa, highlighting its potential as a natural

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and effective therapy for PUD. However, further research is needed to validate its clinical efficacy and ensure its safety for long-term use.

Keywords: p-coumaric acid, *In-silico* molecular interaction, Peptic ulcer, Network pharmacology.

HEALTHMEDICON/25/EPP-033

NETWORK PHARMACOLOGY AND MOLECULAR INTERACTION STUDY OF AESCULIN AND ITS DERIVATIVES AS ANTIDIABETIC AGENTS

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Aesculin, a natural coumarin glycoside, has shown significant potential in managing diabetes mellitus and enhancing wound healing in diabetes-induced impaired conditions. This study explores the pharmacological mechanisms and therapeutic targets of Aesculin using a network pharmacology approach. The SMILES representation of Aesculin was obtained from PubChem, and its predicted target genes were identified through the SwissTargetPrediction web server and standardized using the UniProt database. Diabetes-related genes were sourced from DisGeNet and GeneCards databases and overlapping genes between Aesculin targets and diabetes-related genes were visualized using a Venn diagram. Key overlapping targets included CA9, CA2, ADORA2A, GSK3B, and ADORA1. Protein-protein interaction (PPI) network analysis, conducted via STRING and visualized using Cytoscape, identified core genes critical to Aesculin's therapeutic effects. Functional enrichment analysis performed with ShinyGO revealed biological pathways associated with diabetes regulation and wound healing. The results indicate that Aesculin modulates multiple pathways, including glycogen metabolism and inflammatory responses, contributing to its therapeutic efficacy. This study underscores the potential of Aesculin as a multitarget therapeutic agent for diabetes management and wound healing, paving the way for its further exploration in clinical applications and formulation development.

Keywords: Aesculin, In-Silico, Molecular Interaction, Diabetes, Network Pharmacology.

HEALTHMEDICON/25/EPP-034

EVALUATION OF NEPHROPROTECTIVE EFFECT OF SEED EXTRACT OF QUERCUS LEUCORTICHOPHORA AGAINST GENTAMICIN INDUCE NEPHROTOXICITY IN EXPERIMENTAL ANIMAL RAT

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It is known that the commonly used antibiotic i.e., Gentamicin causes nephrotoxicity, which damages the kidneys. *Quercus Leucortichophora* has been shown in these studies to protect against kidney injury by reducing oxidative stress, swelling and fibrosis in renal tissues. The aim of this study is to find out whether *Quercus Leucortichophora* protects Wistar rats from Gentamicin-induced nephrotoxicity. 24 Wistar rats have been divided into 4 groups: Control group, Toxic group, treatment-1 group, and treatment-2 group. At the end of the experiment, blood and kidney tissue samples were isolated for biochemical tests and histopathological evaluation. Renal impairment was indicated in the GT group as they were having significantly higher serum creatinine level and BUN levels as compared to the control

group. However, in the GT group, the QL+GT collecting showed noticeably lower levels of these makers indicating that *Quercus Leucorticophora* may have nephroprotective effect against gentamicin-induced nephrotoxicity. Gentamicin-induced oxidative damage is reduced by *Quercus Leucorticophora* administration, which increases the activity of the antioxidant enzymes such as superoxide dismutase and catalase.

Keywords: Renal failure, histopathology, Wistar rats, nephrotoxicity, and *Quercus Leucorticophora*

HEALTHMEDICON/25/EPP-035

MICROBIAL NANOTECHNOLOGY: BUILDING BLOCKS FOR THE NEXT INDUSTRIAL REVOLUTION

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Microbial nanotechnology, an innovative intersection of microbiology and nanotechnology, is rapidly emerging as a transformative force in numerous industries, including medicine, agriculture, energy, and environmental remediation. Microorganisms, due to their inherent ability to synthesize nanoscale materials, serve as cost-effective, sustainable, and environmentally friendly platforms to produce nanomaterials. This review explores the key microbial-based processes for nanoparticle synthesis, such as bio reduction, biosorption, and bio mineralization. Recent advancements in engineering microbial strains for enhanced production and functionalization of nanoparticles are also highlighted, showcasing their diverse applications in drug delivery, bioremediation, and biosensors. Furthermore, microbial nanomaterials, such as nanoparticles, nanotubes, and nanowires, offer exciting potential in fields like bioelectronics and green manufacturing. The paper emphasizes the urgent need for research focused on the scaling up of microbial nanotechnologies to bridge the gap between laboratory-scale experiments and industrial applications. By delving into the challenges and future prospects, this review outlines the potential of microbial nanotechnology as a key player in the next industrial revolution, with its capacity for sustainable and scalable solutions in various sectors.

Keywords: Microbial nanotechnology, biosynthesis, nanomaterials, sustainable manufacturing, industrial revolution

HEALTHMEDICON/25/EPP-036

INVESTIGATION OF ANTIOXIDANTS, ANTI DIABETIC AND ANTIHYPERLIPIDEMIC ACTIVITY OF *Vitex trifolia* SEEDS IN DIABETIC ZEBRAFISH MODEL

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Diabetes and obesity are now regarded as global epidemics. Researchers coined the term "diabesity" to describe the relationship between these two diseases as obesity and diabetes rates rise simultaneously. Type 2 diabetes mellitus, heart disease, and numerous types of cancer are all made more likely by obesity. Diabetes and obesity are two examples of complex diseases

that are influenced by both hereditary and environmental factors. Due to the lack of knowledge regarding the underlying pathophysiology of obesity and diabetes, additional research is needed before pharmacological and surgical treatments can be used. Therefore, it is essential to use animal models of diabetes and/or obesity to advance our understanding of these conditions as well as to find and create efficient treatments for them. Zebrafish is a desirable model system for studying metabolic diseases due to functional conservation in lipid metabolism, adipose biology, pancreas structure, and glucose homeostasis. Finding new approaches to prevent and treat human diseases like diabetes and obesity is a good fit for it. This review discusses the advantages and disadvantages of using zebrafish as a model to study the pathologies associated with obesity and diabetes. It focuses on studies that have used zebrafish as a model for these diseases.

Keywords- Diabetes, Zebrafish, Obesity, Herbal plant

HEALTHMEDICON/25/EPP-037

TENS PARAMETER RELATED TO CHEST PAIN WITH COUGH

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Chronic Cough is one of the common, painful symptoms associated with cardiopulmonary conditions which slowly deteriorates the physical capacity of the patient. This is often treated with pharmacological interventions. Recent studies have investigated Transcutaneous Electrical Nerve Stimulation (TENS) as a non-invasive alternative for managing chronic and acute cough, particularly in post-surgical and neuropathic cases. This paper reviews 10 clinical studies on the tolerability, feasibility, and efficacy of TENS across various clinical contexts, including thoracic and cardiac surgery, chronic obstructive pulmonary disease (COPD), and neuropathic cough. The studies highlight the importance of TENS parameters, such as electrode placement, stimulation intensity, and duration, in optimizing treatment outcomes. TENS has demonstrated significant potential in alleviating postoperative pain, improving pulmonary function, and reducing cough sensitivity. Furthermore, transcutaneous auricular vagus nerve stimulation (taVNS) has shown promising results in modulating cough sensitivity based on stimulation settings. The findings suggest that TENS, whether applied over acupoints, thoracic regions, or auricular vagus nerve, may offer a safe, effective alternative to pharmacological treatments for cough management, particularly in high-risk surgical and cardiopulmonary patients. This review consolidates the evidence supporting TENS as a versatile therapeutic modality, emphasizing the need for further investigation into optimal stimulation parameters and patient-specific considerations.

Keywords: Chronic cough, Transcutaneous Electrical Nerve Stimulator, postoperative pain, cardiopulmonary conditions, pulmonary function.

HEALTHMEDICON/25/EPP-038

COMPREHENSIVE PHYSIOTHERAPY APPROACHES IN MANAGING LYMPHEDEMA AMONG BREAST CANCER SURVIVORS: ENHANCING MOBILITY, REDUCING PAIN, AND IMPROVING QUALITY OF LIFE

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Lymphedema is a prevalent and challenging complication in breast cancer survivors, arising from lymphatic system disruption due to surgery or radiation therapy. Characterized by chronic swelling, pain, and restricted mobility, it significantly impacts quality of life by increasing limb size, reducing muscle mass, and limiting strength and range of motion (ROM). Physiotherapy plays a pivotal role in managing lymphedema through interventions aimed at reducing swelling, improving mobility, and alleviating pain. This review consolidates findings from 12 studies that highlight the effectiveness of Manual lymphatic drainage (MLD), Compression therapy, Taping, Stretching, Strengthening, Complete Decongestive Therapy (CDT) in breast cancer survivors. Manual Lymphatic Drainage (MLD) Decreased limb and breast lymphedema. Reduced skin tightness and pain. Compression Therapy reduced swelling and limb circumference. From these evidence we observed that Taping enhanced lymphatic flow, improved mobility and reduced discomfort during activities; Stretching Exercises increased shoulder mobility; Strengthening Exercises Enhanced muscular strength and endurance and Complete Decongestive Therapy (CDT) which is the combination of manual lymphatic drainage (MLD), compression therapy, and therapeutic exercises, focuses on reducing limb swelling, improving lymphatic flow, and enhancing quality of life for patient remains the cornerstone of lymphedema management in enhancing physical function and overall quality of life for breast cancer survivors with lymphedema.

Keywords: Lymphedema, Breast cancer, Complete Decongestive Therapy (CDT), Manual lymphatic drainage (MLD), Compression therapy.

HEALTHMEDICON/25/EPP-039

REVOLUTIONIZING DRUG DISCOVERY: THE ROLE OF CHEMOMETRIC TECHNIQUES IN PHARMACEUTICAL RESEARCH

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Chemometric methods, which provide strong instruments for data analysis, interpretation, and decision-making, have become essential in the drug discovery industry. These techniques use mathematical and statistical modelling to glean valuable insights from intricate datasets produced throughout the drug development process. Applications range from formulation optimisation and quality control to high-throughput screening and structure-activity relationship (SAR) modelling. To increase accuracy and efficiency, methods like multivariate curve resolution (MCR), artificial neural networks (ANN), partial least squares (PLS), and principal component analysis (PCA) are essential. By combining information from spectroscopy, chromatography, and bioassays, chemometrics makes it possible to identify lead

chemicals, forecast pharmacokinetics, and optimise formulations. In addition to speeding up the drug development process, the use of chemometric techniques has reduced experimental expenses and improved regulatory compliance. This article explores the key chemometric techniques, their applications, and impact on modern drug discovery processes, highlighting their potential to revolutionize pharmaceutical research and development.

Keywords: Chemometry, MCR, PCA, PLS

HEALTHMEDICON/25/EPP-040

**ASTROPHARMACY: ADDRESSING THE UNIQUE CHALLENGES OF SPACE
HEALTHCARE**

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A growing multidisciplinary field at the nexus of biotechnology, space science, and pharmacy is called Astropharmacy. In order to meet the particular healthcare needs of astronauts on extended space missions, it focusses on the creation, stability, storage, and distribution of medications in space conditions. Innovative approaches to medicine formulation and production are required in interplanetary settings due to the microgravity, radiation exposure, storage limitations, and lack of resupply possibilities. The kinetics of drug degradation in space, optimising drug delivery methods in physiologically changed environments, and utilising cutting-edge technologies like bioprinting and on-demand pharmaceutical production are important study fields. Astropharmacy also looks into how space-based bioreactors can be used to create complex biologics and how space circumstances can change the way drugs work and how they are metabolised. This field aims to enable sustained human presence in space and prepare for trips to Mars and beyond by combining knowledge from aeronautical engineering, pharmacology, and molecular biology. This article highlights astropharmacy's vital role in protecting spacefarers' health and safety by outlining its recent developments, difficulties, and potential future paths.

Keywords: Astropharmacy, aeronautical engineering, pharmacology, spacefarer

HEALTHMEDICON/25/EPP-041

**A REVIEW: RECENT DEVELOPMENTS IN ANALYTICAL METHODS FOR DRUG
FORMULATION AND STABILITY STUDIES**

Maru Khushbu M, DARSHIT RAM*

Noble University, Junagadh, India

Drug formulation and stability are critical aspects of pharmaceutical development, ensuring the drug's safety, efficacy, and shelf life. Over the years, advancements in analytical techniques have played a crucial role in improving the characterization, quality control, and stability testing of pharmaceutical products. This review presents recent developments in analytical methods employed in drug formulation and stability studies, highlighting innovations such as mass spectrometry (MS), nuclear magnetic resonance (NMR) spectroscopy, and other modern techniques like Raman spectroscopy and in silico modeling. The paper discusses the impact of

these innovations on pharmaceutical analysis, their advantages, and challenges, as well as future directions in the field.

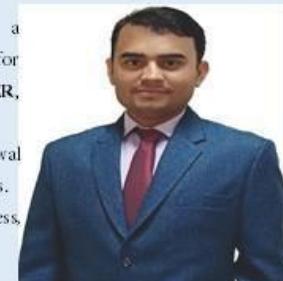
Keywords: Analytical methods, Stability study, Pharmaceutical analysis, Mass spectroscopy (MS), NMR, QA, QC, Analytical techniques.

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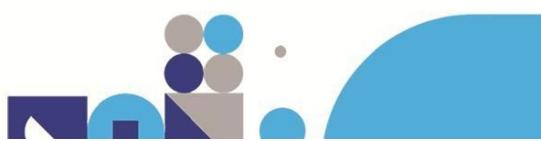
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