



AMITY
UNIVERSITY
— MADHYA PRADESH —



AMIPHARM

AN OFFICIAL NEWSLETTER OF AMITY INSTITUTE OF PHARMACY

VOLUME-1 • ISSUE-2

APRIL-JUNE 2024



AMITY INSTITUTE
OF PHARMACY



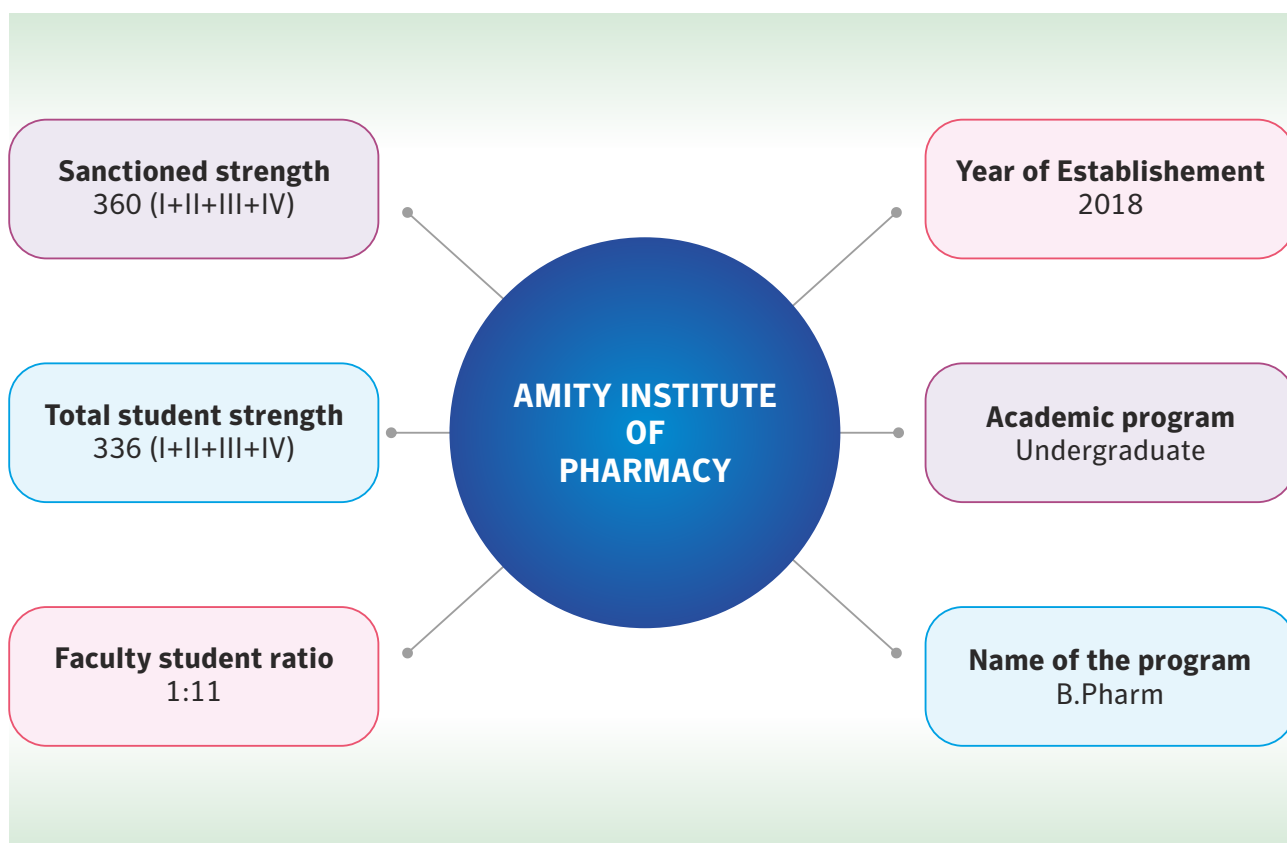


ABOUT AMITY INSTITUTE OF PHARMACY

Amity Institute of Pharmacy (AIP) was established in 2018 and offers a Bachelor of Pharmacy, a 4-year undergraduate program. The institute is part of Amity University Madhya Pradesh, recognized by University Grants Commission (UGC), approved by the Pharmacy Council of India (PCI). The Committee for the Control and supervision of experiments on animals (CCSEA) approved the institute for conducting preclinical studies for education and research. The institute is also approved by the Indian Pharmacopoeia Commission (IPC), Pharmacovigilance Program of India for monitoring and reporting adverse drug reactions. The institute has a sprawling campus, providing a pleasant and intellectually stimulating ambiance. It has spacious air-conditioned lecture theaters, technology-enhanced state of art laboratories with access to

cutting-edge and contemporary equipment for academic learning and research.

The institute pays special attention on Industrial training, practice school courses and research projects to the participants. The institute is passionate about grooming leaders who are not only thorough professionals, but also good human beings with values and “sanskars” who can make a difference globally. The institute strives to ensure good placements across diverse roles by providing training sessions. The institutes launch impactful campaigns and excellent community outreach activities to help students nurture relationships and stay socially responsible. The institute encourage students to attend co-curricular and extracurricular activities to create a positive and supportive environment that recognizes and rewards their participation.





FROM DIRECTOR'S DESK



Dear Esteemed Readers,

When a thought that has been enduring in mind becomes real, it is truly an interesting and exciting experience.

On behalf of the Editorial Board and the Editorial Team of "AMIPHARM", I am delighted to present the 2nd edition of our Newsletter showcasing the latest developments and achievements at the Amity Institute of Pharmacy, Amity University Madhya Pradesh

This edition highlights the collective efforts, successes and accomplishments of our esteemed faculty, researchers, and students. From groundbreaking research findings to insightful articles, it reflects our steadfast commitment to advancing knowledge and fostering innovation.

As we navigate the ever-evolving, dynamic landscape of pharmaceuticals, I encourage each of you to actively engage and immerse yourself with the content presented in this newsletter. Let us seize this opportunity to deepen our understanding, explore new horizons, foster & promote collaboration, inspire positive change within our respective domains.

I extend my heartfelt gratitude to all contributors, editors, and readers whose passion and dedication have brought this newsletter to life. Your invaluable support ensures that "AMIPHARM" continues to inspire and inform. Your enthusiasm is truly commendable, and together, I am confident we will continue to achieve excellence.

We eagerly anticipate your feedback to further enhance our newsletter and better serve your interests. In the spirit of continuous improvement, any constructive input on streamlining our processes is very welcome. Thank you for your ongoing enthusiasm and commitment to excellence.

Happy reading!

With Warm Regards

Dr. S. Mohana Lakshmi

Director, Amity Institute of Pharmacy
Amity University Madhya Pradesh



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STUDENT'S ACHIEVEMENTS



First place in the poster presentation (UG) at the AIP 2024 National Conference 2024.



Recipient of the first position oral presentation (UG) at the AIP National Conference 2024.



First place in the poster presentation (PG) at the AIP 2024 National Conference 2024



Recipient of the Second position oral presentation (PG) at the AIP National Conference 2024



Second place in the oral presentation (UG) at the AIP 2024 National Conference 2024



B.Pharm VIII students (Ankit Sharma, Abhay Sharma & Vridhi) published an article in Q1

NATIONAL CONFERENCE 2024

The Amity Institute of Pharmacy at Amity University Madhya Pradesh, Gwalior, organized a National Conference on “Cardiovascular Diseases: Prevention, Management, and Treatment” on the 9th and 10th of April 2024. This conference focused on prevention, management, and treatment, bringing together experts, practitioners, policymakers, and stakeholders from across the country. The event aimed to address the challenges, advancements, and best practices in combating cardiovascular diseases (CVDs), which remain a leading cause of morbidity and mortality globally.

Distinguished guests at the conference included Dr. Montu Kumar Patel (Hon'ble President of the Pharmacy Council of India), Dr. Deependra Singh (Chairman, Education Regulation Committee, Pharmacy Council of India, New Delhi), and Professor (Dr.) Pradeep Kumar Prajapati (Vice Chancellor, Dr. Sarvapalli Radhakrishnan Ayurved University, Jodhpur, Rajasthan).

Keynote speakers were Dr. Puneet Rastogi (Professor and Head, Department of Cardiology, Gajara Raja Medical College, Gwalior, Madhya Pradesh), Dr. Ratinder Jhaj (Professor and Head, Department of Pharmacology, All India Institute of Medical Science (AIIMS), Bhopal, Madhya Pradesh), Dr. Varun Bansal (Head of Department, Indraprastha Apollo Hospital, Sarita Vihar, New Delhi), and Dr. Neha Wadhwa (Indraprastha Apollo Hospital, Sarita Vihar, New Delhi). Their insightful sessions greatly enriched the conference, benefiting participants, researchers, research scholars, and students with their vast knowledge. Scholars and students from various institutes across the country participated in the conference. During the event, conference proceedings with an ISBN and a newsletter of the Amity Institute of Pharmacy (AUMP) were released. The conference received 57 abstracts for poster presentations, 13 abstracts for oral presentations, and 22 full-length articles, significantly enriching the research publications, citations, and ranking of AUMP.



Lamp Lightning: By Hon'ble Pro Chancellor, Vice Chancellor and Dignitaries



Felicitation: Guest of Honor Dr. Deependra Singh (Chairman, Education Regulation Committee, Pharmacy Council of India, New Delhi) by Hon'ble Pro Chancellor and Vice Chancellor



Keynote Speech: Delivered by Dr. Puneet Rastogi, Prof. & Head Department of Cardiology, GRMC, Gwalior



Keynote Speech: Delivered by Dr. Ratinder Jhaj (Professor and Head, Department of Pharmacology, AIIMS Bhopal)

NATIONAL CONFERENCE 2024



Release of Newsletter and
Conference Proceedings



CPR Training Session Conducted by the
Medanta Hospital Team, Haryana



Poster evaluation by the
Dr Arya Lakshmi, DIPSARU, New Delhi



Poster evaluation by
Dr Saroj Kothari, GRMC, Gwalior



Scientific Session



Oral and Poster Awardees with Hon'ble
Pro Chancellor and other dignitaries



PLACEMENTS@2024

Name of Student	Company	Department
Ankit Sharma	Macleods Pharmaceuticals, Sikkim	Quality Control
Ayushi Chhabra	Macleods Pharmaceuticals, Gujrat	Quality Control
Bhuvnesh Yadav	Macleods Pharmaceuticals, Sikkim	Quality Control
Deshdeepak	Macleods Pharmaceuticals, Sikkim	Quality Control
Gaurav Tiwari	Macleods Pharmaceuticals, Baddi	Quality Control
Himanshu Gupta	Macleods Pharmaceuticals, Baddi	Quality Control
Manjeet Kumar	Macleods Pharmaceuticals, Baddi	Quality Control
Navdeep Asthana	Macleods Pharmaceuticals, Sikkim	Quality Control
Prakhar Singh	Macleods Pharmaceuticals, Sikkim	Quality Control
Pranjal Mishra	Macleods Pharmaceuticals, Sikkim	Quality Control
Sanjeev Kumar	Macleods Pharmaceuticals, Sikkim	Quality Control
Shivam Singh Chauhan	Macleods Pharmaceuticals, Pithampur	Quality Control
Vivek Yadav	Macleods Pharmaceuticals, Sikkim	Quality Control
Yogesh Tomar	Macleods Pharmaceuticals, Sikkim	Quality Control
Adarsh Jain	Macleods Pharmaceuticals, Sikkim	Quality Control
Harender Singh	Panacea Smart Solution, Noida	Medical Scribe Trainee
Mishika Singh	Panacea Smart Solution, Noida	Medical Scribe Trainee
Rhythm Milan	Panacea Smart Solution, Noida	Medical Scribe Trainee
Sakshi Mehra	Panacea Smart Solution, Noida	Medical Scribe Trainee
Ashutosh Kumar Singh	IDS Infotech, Mohali	Medical Scribe Trainee
Anshika Bhatnagar	IDS Infotech, Mohali	Medical Scribe Trainee
Radhika Gupta	Edclaps Innovation, Lucknow	BDA

FAREWELL PARTY 2024

The juniors organized a heartfelt farewell party for the seniors, marking the end of their academic journey. The celebration included speeches, performances, and skits highlighting memorable moments. The atmosphere was festive yet sentimental, with seniors receiving mementos

and heartfelt messages of appreciation. This gathering allowed juniors to express their gratitude and wish the seniors success in their future endeavors. It was a perfect send-off, reflecting the strong bond between the juniors and seniors.



Miss & Mr. Farewell (Juhi & Shivam) with Director, AIP



Miss & Mr. Farewell with Faculty Members of AIP



Farewell (Alvida) 2024



B. Pharm 2020-24 with Faculties of AIP

GLIMPSE OF CO-CURRICULAR ACTIVITIES

Co-curricular activities play a pivotal role in the holistic development of students, extending beyond the confines of the traditional academic curriculum. Students visited pharmaceutical industries, Dindayal Industries Ltd. and Godrej Ltd., Malanpur. The visit provided an insightful glimpse into the sophisticated processes involved in pharmaceutical production. Students observed the various stages of tablet manufacturing, from raw material preparation to final packaging. The experience was highly educational, offering

us a practical understanding of the theoretical concepts learned in class and inspiring many of us to explore careers in the pharmaceutical industry. A workshop was conducted for Vacuum Rotary Evaporator on 09th May 2024. The session covered the principles of rotary evaporation, including solvent removal, concentration of solutions, and sample purification. Expert instructors demonstrated the setup, operation, and maintenance of the evaporator, emphasizing safety protocols and best practices.



Industry visit at Dindayal Industries Ltd., Malanpur



Workshop on the vacuum rotary evaporator, AIP



Students visit to tablet packaging department, Dindayal Industries Ltd.

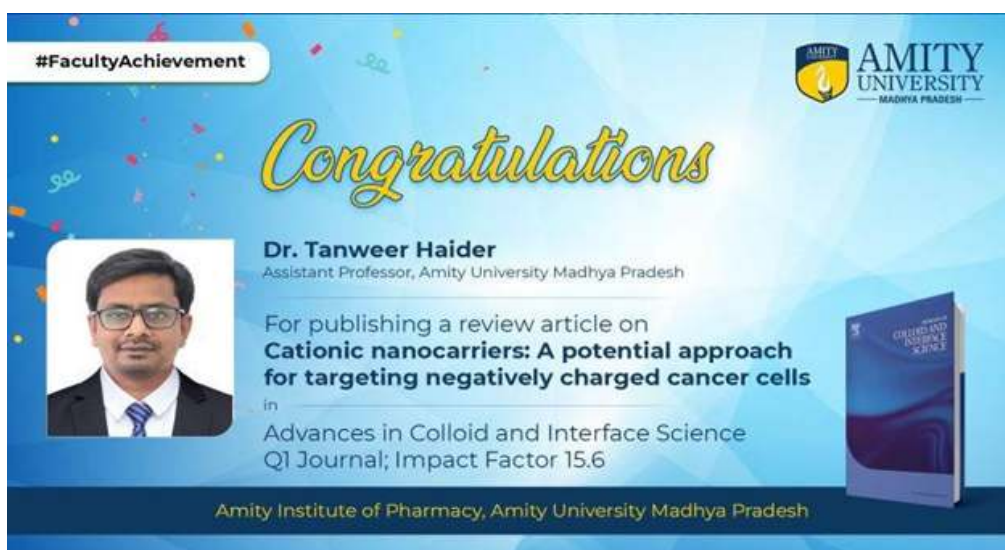


Essay writing competition on World Intellectual Property Day 2024

FACULTY ACHIEVEMENTS

Congratulations to Dr. Tanweer Haider, Asst. Prof., Amity Institute of Pharmacy, for a review article on "Cationic nanocarriers: A potential approach for targeting negatively charged cancer

cells" published in "Advances in Colloid and Interface Science" a Q1 journal by Elsevier with an Impact Factor 15.6.



Congratulations to Dr. Vikas Pandey, Amity Institute of Pharmacy, Gwalior and B.Pharm students Ankit Sharma, Abhay Sharma, and Vridhi Kumari for their outstanding achievement in publishing a review article on "The Role of Silk

as Natural Biomaterial in Food Safety" in the prestigious journal "Food Bioscience" (Q1 Journal; Impact Factor 5.2). showcasing innovative approaches and research findings that can enhance food safety.

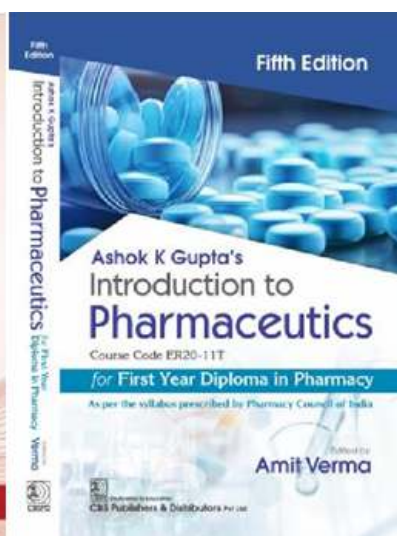
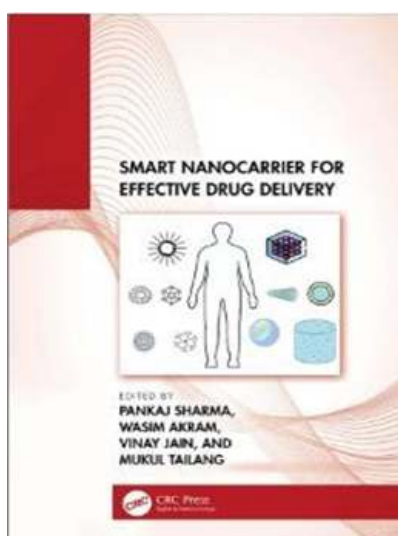


FACULTY ACHIEVEMENTS

- Dr. Wasim Akram, Assistant Professor at Amity Institute of Pharmacy, edited a book in CRC press Taylor & Francis group titled as Smart Nanocarrier for Effective Drug Delivery.
- Dr. Amit Verma, Assistant Professor at Amity Institute of Pharmacy, published the books "Introduction to Pharmaceutics" by CBS

Publishers & Distributors Pvt. Ltd. and "A Textbook of Hospital and Clinical Pharmacy" by GDC Publication.

The Honorable Pro-Chancellor Lt. Gen. V. K. Sharma (AVSM) appreciated the faculties for their achievements.





PHARMA NEWS UPDATES

Sun Pharma's Utreglutide demonstrates significant weight loss at the American Diabetes Association 84th Scientific Sessions

Sun Pharmaceutical Industries Limited announced positive results from a Phase 1 study of GL0034 (Utreglutide), a novel GLP-1 receptor agonist, demonstrating significant weight loss and lipid profile improvements in obese adults. Presented at the 84th American Diabetes Association Scientific Sessions, the study highlights GL0034's potential beyond weight loss, offering notable cardiometabolic benefits. Richard E. Pratley, MD, emphasized the therapy's promise in weight management, while Dilip Shanghvi, Managing Director of Sun Pharma, reiterated the company's commitment to tackling global obesity. These findings pave the way for further research and development of this innovative therapy.

EU Approves Sanofi's Dupixent for COPD ("Smoker's Lungs")

Sanofi and Regeneron received European Union approval for broader use of their Dupixent injection to treat chronic obstructive pulmonary disease (COPD) in patients unresponsive to standard inhaled drugs. This EU approval, faster than the U.S. FDA's review, followed a recommendation by the European Medicines Agency. The FDA extended its review deadline to September 27 for additional efficacy data. COPD, affecting millions in the U.S. and Europe, is also known as "smoker's lungs." Dupixent, already approved for conditions like asthma and eczema, generated 10.7 billion euros in 2023 revenue for Sanofi, with a forecast of 13 billion euros for 2024.

Orchid Pharma Collaborates with Cipla to Launch Antibiotic Cefepime-Enmetazobactam in India

Orchid Pharma, based in Chennai, India, announced the launch of its new drug, Cefepime-Enmetazobactam, approved for treating

complicated urinary tract infections (cUTI), hospital-acquired pneumonia (HAP), and ventilator-associated pneumonia (VAP). Partnering with Cipla Limited, Orchid aims to rapidly distribute this breakthrough antibiotic across India, addressing antimicrobial resistance (AMR). The collaboration combines Orchid's drug development expertise with Cipla's distribution network. This new antibiotic helps spare Carbapenems, preserving their efficacy. Both companies emphasize responsible antibiotic use and will develop educational initiatives to ensure appropriate prescribing and minimize further resistance, reinforcing India's leadership in medical innovation.

FDA approves Eli Lilly's alzheimer's drug

The U.S. FDA approved Eli Lilly's Kisunla (donanemab-azbt) injection for treating Alzheimer's disease in adults with mild cognitive impairment or mild dementia. In a study with 1,736 patients, Kisunla significantly slowed clinical decline compared to placebo, showing notable improvements on the Integrated Alzheimer's Disease Rating Scale (iADRS), ADAS-Cog13, and ADCS-iADL. Patients also showed reduced decline on the Clinical Dementia Rating Scale. The study's mean participant age was 73, with a diverse demographic. FDA's Teresa Buracchio highlighted Kisunla's effectiveness in reducing cognitive and functional decline, offering hope for Alzheimer's patients and their families.

Know Labs' Early Clinical Success with Needle-Free Glucose Sensor

Know Labs has unveiled new proof-of-concept data for its needle-free blood sugar monitor, which continuously scans blood through the skin. Using machine learning, this digital, noninvasive method accurately detects high, low, or normal glucose levels 93.37% of the time compared to venous blood analysis. The latest study, published in the Diabetes Technology &



Therapeutics Journal, involved 31 adults with Type 2 diabetes or prediabetes and utilized a radiofrequency sensor during oral glucose tolerance tests. It gathered over 2,600 data pairs to train an AI model and evaluate sensor performance. The system achieved a false-negative rate of under 4% and a false-positive rate of about 15% for normal glucose levels, improving to nearly 3% false positives during

hyperglycemia. The sensor effectively differentiated between high and low blood sugar readings with minimal misclassification. Know Labs aims to enhance device sensitivity and expand datasets as it pursues FDA clearance for its noninvasive continuous glucose monitor. Targeting regions with low diabetes diagnosis rates, the technology has the potential to enhance early intervention and optimize healthcare resources.

FACULTY CORNER

SILK AS BIOMATERIAL FOR DRUG DELIVERY



Dr. Vikas Pandey

Associate Professor Department of Pharmaceutics
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Polymeric drug delivery systems have emerged as an efficient alternative to conventional formulations, offering a reservoir for active pharmaceutical ingredients (APIs), enhancing their physicochemical properties, and addressing significant drug delivery challenges such as specific targeting, intracellular transport, and biocompatibility. These advancements aim to improve treatment efficacy and patient quality of life. Among natural polymers, silk stands out due to its unique physicochemical and mechanical properties, making it a desirable biomaterial for biomedical and pharmaceutical applications.

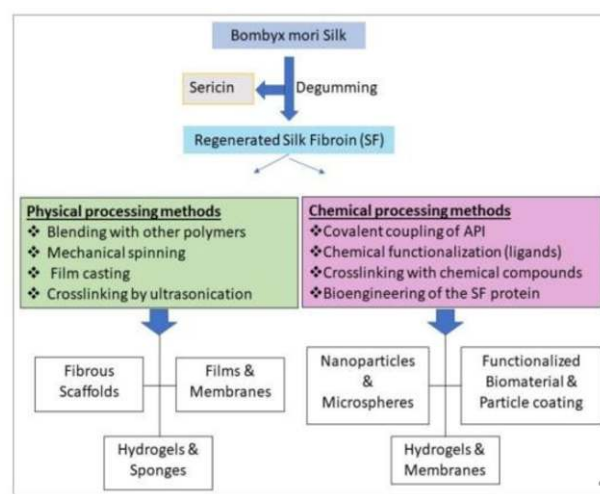
An ideal drug delivery system should stabilize the loaded API, modulate its release kinetics, and minimize adverse effects through tissue-specific

targeting, particularly for highly toxic drugs like anticancer agents. Historically valued in the fabric industry, silk has gained substantial attention over the past decades as a promising biopolymer for medical and pharmaceutical use. Silk protein possesses a unique combination of properties rarely found among natural polymers. It consists of two main components: fibroin, the primary structural protein, and sericin, which acts as a supportive glue. The primary structure of silk fibroin features repetitive amino acid sequences, predominantly glycine-alanine-glycine-alanine-glycine-serine (GAGAGS) repeats. During the sol-gel transition, these GAGAGS repeats form crystalline structures by adopting highly ordered secondary structures, such as β -sheets. The silk fibroin from the cocoon

of the silkworm *Bombyx mori*, the most studied of silkworm silk proteins, contains two major components: light (~25 kDa) and heavy chain (~325 kDa) fibroins. The core sequence of the heavy chain includes alanine-glycine repeats.

In silkworm cocoons, the two fibroins are encased in a sericin coat, forming the composite fibers of the cocoon. Sericin, an amorphous and hydrophilic protein, acts as an adhesive, joining fibroin filaments and constituting about 20-25% of the total weight of raw silk. However, sericin can cause immunogenic reactions and is therefore removed from silk fibroin. This removal process, known as degumming, involves boiling the silk in an alkaline solution, typically 0.02 M Na₂CO₃. After degumming, silk fibroin remains as a versatile biomaterial that can be shaped into various forms, dimensions, and structures. Silk fibroin has been used in sutures for centuries and was recognized by the US FDA as a biomaterial in 1993.

Silk proteins, namely sericin and fibroin, are utilized in drug delivery and biomedical applications due to their unique mechanical and physicochemical properties, such as biocompatibility, slow biodegradability, and self-assembly. Silk fibroin, in particular, is extensively used in drug delivery because of its versatility, chemical modifiability, and controllable degradability. Silk fibroin drug delivery systems can encapsulate and stabilize various small drug molecules, enzymes, proteins, vaccines, and DNA, thereby prolonging their shelf-life and duration of action in the body. These silk-based systems have shown favorable bioactivities in delivering chemotherapy agents for cancer treatments, promoting wound healing, sustaining the release of cytokines and morphogens, delivering antibiotics, and facilitating gene therapy, among other applications.



Silk proteins offer unlimited potential for controlled drug delivery. Silk and silk protein fibers possess specific biodegradability, chemical stability, impressive mechanical properties, regeneration ability, and biocompatibility, making them highly suitable for delivering genes, drugs, and enzymes. This versatility positions silk proteins as promising materials in biomedical engineering, pharmaceutical, and biomaterials applications. Additionally, modified silk nanoparticles enhance the targeting and delivery capabilities of chemotherapeutics, further expanding their potential in medical treatments.

Silk proteins are highly valuable for the targeted and improved delivery of drug and gene molecules. The various functional groups of silk proteins allow for modifications that enable specific delivery to cells, tissues, or organs.

In conclusion, silk proteins hold significant promise for drug delivery applications due to their unique combination of biocompatibility, controlled biodegradation, strong mechanical properties, and versatility in chemical modifications.



THE GUT CONNECTION: EXPLORING GUT TREATMENT STRATEGIES FOR RHEUMATIC ARTHRITIS



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Introduction

Rheumatic Arthritis (RA) is a persistent inflammatory condition affecting the joints, marked by heightened sensitivity to pain. It involves the infiltration of T- lymphocytes, macrophages, and the formation of pannus on the synovial membrane, which progressively erodes cartilage and bone, leading to impaired joint function. Traditional treatments for arthritis typically include Non-Steroidal Anti-Inflammatory Drugs (NSAIDs), pain relievers, glucocorticoids, and Disease-Modifying Anti-Rheumatic Drugs (DMARDs). The current approach basically treating with NSAIDs to reduce the pain and inflammation, while DMARDs are used to slow disease progression. However, long-term use of these medications can cause adverse effects such as gastrointestinal and cardiovascular issues. As a result, individuals with chronic inflammation often seek complementary and alternative therapies, including herbal remedies, for symptomatic relief.

Recent studies have brought into focus the complex interconnection between gut health and RA, emphasizing the pivotal role of the gut microbiome in both the development and management of this persistent autoimmune disorder. For instance, research has shown that alterations in the composition of gut bacteria can

influence immune responses and inflammation levels throughout the body, potentially exacerbating or ameliorating RA symptoms. For example, probiotics—beneficial bacteria that can restore microbial balance in the gut—are being studied for their potential to reduce inflammation and modulate immune activity in RA patients. Similarly, dietary interventions that promote a healthy gut microbiota, such as fiber-rich diets or specific prebiotics, are also being explored as complementary strategies to conventional RA treatments. By elucidating these connections and developing targeted interventions, researchers aim to improve symptom management and long-term outcomes for individuals living with RA, offering promising avenues for more personalized and effective therapeutic approaches.

The Gut Microbiome and Rheumatic Arthritis

The gut microbiome, composed of trillions of microbes residing in the gastrointestinal tract, influences immune function, inflammation, and overall health. Dysbiosis, an imbalance in the gut microbiota composition, has been implicated in various autoimmune diseases, including RA. Studies have shown that RA patients often exhibit distinct alterations in their gut microbiome compared to healthy individuals, characterized by reduced microbial diversity and specific bacterial taxa.



Mechanisms Linking Gut Dysbiosis to Rheumatic Arthritis "Dysbiosis in the composition of gut microbiota, characterized by imbalances, can disrupt the delicate balance triggers systemic inflammation and activates autoimmune responses that specifically target joint tissues, exacerbating symptoms of RA. The metabolites produced by gut microbes play a crucial role in influencing immune responses and inflammation pathways that are implicated in the development and progression of RA. Maintaining the integrity of the intestinal barrier is essential to prevent the translocation of bacteria or their products from the gut into the bloodstream, which can lead to further immune activation and worsen RA symptoms.

The diversity of microbes within the gut microbiome, comprising bacteria, fungi, and viruses, is pivotal in regulating the immune system. A diverse microbiome is associated with more effective immune regulation and lower levels of inflammation, which can help mitigate the severity of RA symptoms. Conversely, dysbiosis-induced increases in gut permeability, often referred to as 'leaky gut,' can facilitate the passage of bacteria or their byproducts into systemic circulation. "Figure 1 illustrates how dysbiosis, characterized by imbalances in gut microbiota composition, disrupts immune regulation, leading to systemic inflammation and autoimmune responses targeting joint tissues, thereby exacerbating rheumatoid arthritis (RA) symptoms. "This process triggers robust immune responses and systemic inflammation, which contribute to the progression and exacerbation of RA symptoms."

Gut Treatment Strategies for Rheumatic Arthritis

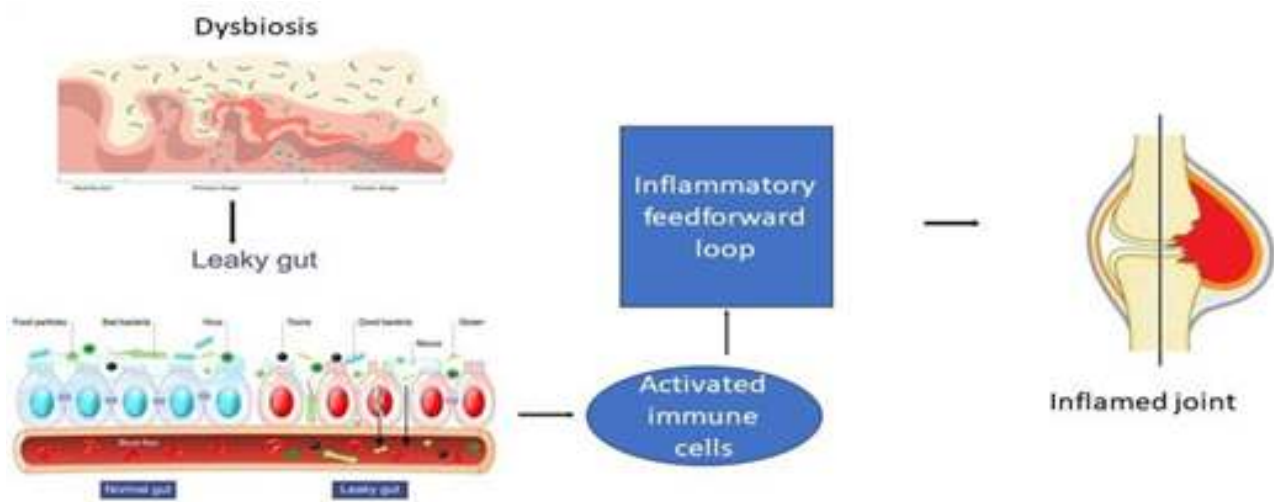
Probiotics are live microorganisms known to confer health benefits when consumed in adequate amounts, while prebiotics are dietary fibers that promote the growth of beneficial gut bacteria. Both probiotics and prebiotics have been extensively studied for their potential to modulate the with the disease. Certain dietary

modifications, such as adopting a Mediterranean diet or increasing intake of fiber- rich and fermented foods, have been shown to composition of gut microbiota in rheumatoid arthritis (RA) patients, aiming to improve symptoms associated promote a healthier balance of gut microbiota and reduce inflammation in individuals with RA. These dietary approaches emphasize the importance of supporting a diverse and beneficial gut microbial community as part of managing RA symptoms. Fecal microbiota transplantation (FMT) represents an experimental approach where fecal material from a healthy donor is transferred to an RA patient to restore microbial balance in the gut.

Although still in investigational stages for RA treatment, FMT holds promise as a potential therapy to modulate gut microbiota composition and alleviate symptoms. Synbiotics, which combine probiotics and prebiotics, represent a synergistic approach aiming to enhance the effectiveness of microbiome-targeted treatments in RA. By providing both beneficial microorganisms and the necessary substrates for their growth, synbiotics aim to optimize gut microbiota health and potentially alleviate RA symptoms through microbiome modulation. "This expanded version provides a detailed explanation of how probiotics, prebiotics, dietary modifications, FMT, and synbiotics can influence gut microbiota and potentially benefit individuals with rheumatoid arthritis.

Mechanisms of Gut Treatments in RA

Probiotics are living bacteria that provide the host health advantages when given in sufficient doses. They have the ability to regulate the microbiota in the gut, which may lessen RA-related inflammation and immunological dysregulation (Restoring Microbial Balance). Probiotics have the potential to regulate immunological responses by increasing pro-inflammatory cytokines (like TNF-alpha and IL-6) and decreasing anti-inflammatory cytokines (like IL-10) (Immunomodulation). Fiber & Prebiotics:



Changes to the gut bacteria have been associated with the development of arthritis; however, the mechanistic connection with disease remains unknown. Material. Identify pathological changes to the gut tissue in arthritis, including Loss of gut-barrier integrity and inflammatory-cell infiltration, and show that Restoration of gut homeostasis ameliorates disease

A varied and healthy gut microbiome is supported by diets high in fiber and prebiotics, which are non-digestible fibers that encourage the development of beneficial gut bacteria. Fatty acids with a short chain (SCFAs): SCFAs are anti-inflammatory compounds that are produced by gut bacteria during the fermentation of dietary fiber and may be able to control immunological responses in RA. Impact on Gut Microbiota: Some RA medications, such as DMARDs and NSAIDs, can affect gut microbiota composition and function. Indirect Effects: By modulating systemic inflammation and immune activation, these medications may indirectly influence gut health and microbial diversity.

There is relation between the gut microbiota, and health and illness has been already established by the several studies. It is well known that the gut

microbiota has an impact on almost every element of the host and that immunological tolerance dysregulation and the development of RA are linked to it. However, there is growing evidence that tailored therapy methods based on patient microbiome profiles may enhance therapeutic effectiveness, reduce toxicity risk, and improve clinical outcome in RA. Targeted modification of the gut microbiota may relieve RA. There are several studies under in the clinical trials which investigating the gut-targeted therapies for RA have shown promising but varied results. Challenges include the complexity of the gut microbiome, individual variability in treatment response, and the need for standardized protocols and long-term studies to establish efficacy and safety.



FLAVONOIDS: AS A PROMISING AGENTS FOR VARIOUS HEALTH BENEFITS



Mr. Deepesh Parashar

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Plants include a class of natural substances known as flavonoids, which have varying phenolic structures. A novel chemical was extracted from oranges in 1930. It was given the name vitamin P at the time because it was thought to belong to a novel class of vitamins. Later, it was discovered that this component was a flavonoid(rutin), and as of today, more than 4000 different flavonoid variants have been discovered. Flavonoids may be found in tea, wine, cereals, roots, flowers, fruits, and vegetables. The health benefits of these natural compounds are widely known, and attempts are being undertaken to separate the components known as flavonoids. Nowadays, flavonoids are seen as an essential component of many pharmacological, cosmetic, nutraceutical, and medical uses. This is explained by their ability to modify the activity of important cellular enzymes as well as their anti-oxidative, anti-inflammatory, anti-mutagenic, and anti-carcinogenic qualities. The finding that flavonoids reduce CHD and have a low cardiovascular death rate gave research on them a boost. Current trends of research and development activities on flavonoids relate to isolation, identification, characterization and functions of flavonoids and finally their applications on health benefits. Natural antioxidants are found in various vegetables such as carrot, beat, tomato, lotus, cauliflower,

cabbage, capsicum etc; green tea leaves; grape stems; orange and apple fruits; barley and maltgrains; olives; ashwagandha; rhubarb; Virginia skullcap; various spices such as cardamom, cinnamon, clove, coriander, ginger, dill, garlic, neem etc.

Health benefits of flavonoids: Antioxidant Activity

Flavonoids are renowned for their potent antioxidant properties, which play a crucial role in protecting the body from oxidative stress and free radical damage. Free radicals are unstable molecules that can damage cells, proteins, and DNA, leading to chronic diseases and aging. By neutralizing these harmful molecules, flavonoids help maintain cellular integrity and reduce the risk of conditions such as cancer, cardiovascular diseases, and neurodegenerative disorders. Studies have shown that a diet rich in flavonoids can significantly improve the body's antioxidant defenses, enhancing overall health and longevity.

Anti-inflammatory Effects

Flavonoids possess strong anti-inflammatory properties, which are beneficial in managing and preventing inflammatory conditions. They achieve this by inhibiting pro-inflammatory cytokines and enzymes like cyclooxygenase-2 (COX-2) and lipoxygenase. Chronic inflammation is a key factor in the development of many

diseases, including arthritis, asthma, and inflammatory bowel disease. By mitigating inflammation, flavonoids help alleviate symptoms, improve quality of life, and potentially reduce the reliance on synthetic anti-inflammatory drugs. This makes flavonoids a valuable component in the dietary management of inflammation-related conditions.

Cardiovascular Protection

The cardiovascular benefits of flavonoids are well- documented, with numerous studies highlighting their role in promoting heart health. Flavonoids enhance endothelial function, which is crucial for maintaining vascular health and regulating blood pressure. They also help reduce low-density lipoprotein (LDL) cholesterol levels and inhibit platelet aggregation, thereby lowering the risk of atherosclerosis and thrombosis. Thus, incorporating flavonoids into

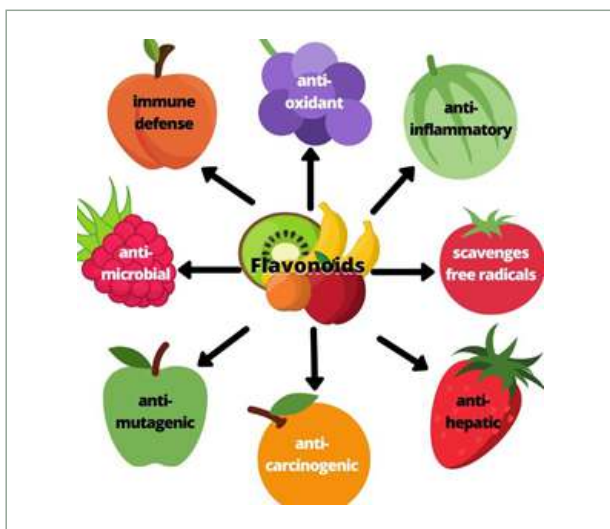
the diet is a natural and effective way to support cardiovascular health.

Anti-cancer Properties

Flavonoids exhibit significant anti-cancer properties, making them a focal point of cancer prevention research. They can inhibit the growth and proliferation of cancer cells through various mechanisms, such as inducing apoptosis (programmed cell death) and suppressing angiogenesis (formation of new blood vessels that feed tumors). Additionally, flavonoids interfere with cancer cell signaling pathways, thereby hindering their ability to spread. Research suggests that a diet rich in flavonoids can reduce the risk of developing certain types of cancers, including breast, prostate, and colorectal cancers. These findings highlight the potential of flavonoids as complementary agents in cancer therapy and prevention strategies.

Neuroprotective Effects

Emerging research indicates that flavonoids also have neuroprotective effects, which are beneficial in maintaining cognitive function and preventing neurodegenerative diseases. Flavonoids can cross the blood-brain barrier and exert antioxidant and anti-inflammatory effects in the brain, protecting neurons from damage. They have been shown to enhance memory, learning, and overall brain function, potentially lowering the risk of conditions like Alzheimer's disease and Parkinson's disease. Regular intake of flavonoid-rich foods, such as dark chocolate, green tea, and berries, can support brain health and improve mental clarity.



M72/AS01E: A REVOLUTIONARY TB VACCINE TO TRANSFORM HEALTHCARE - KEY ADVANCES



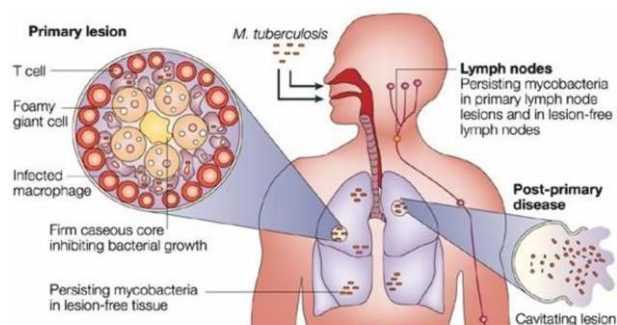
Prof (Dr) S. Mohana Lakshmi

Professor & HOD

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Human TB has existed for thousands of years, no country is TB-free. According to World Health Organisation, in 2022 TB was the second leading infectious killer after COVID-19 and killed more people than HIV/AIDS and one of the leading causes of death from antimicrobial resistance. *Mycobacterium tuberculosis* (Mtb), the etiological agent of tuberculosis (TB), is a leading cause of human disease and death. Globally 10.6 million people are infected with TB with 1.3 million deaths annually.

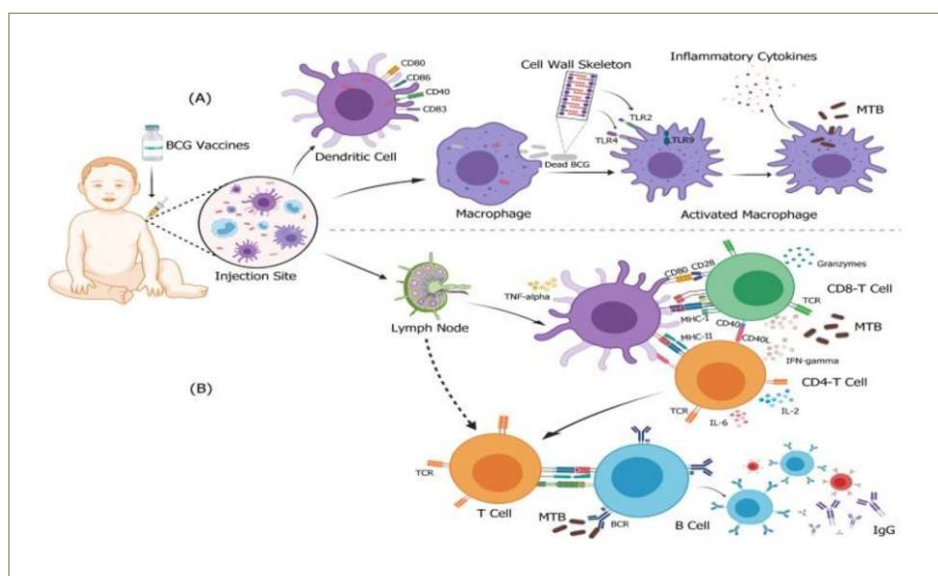
India had an estimated 2.9 million tuberculosis cases and 506 thousand deaths in 2021 representing approximately 30% of the total globally. It is a major issue, particularly in low- and middle-income countries. Novel vaccines effective in adolescents and adults and new TB vaccines with better safety and efficacy than BCG to administer to neonates and infants could reduce this burden.



Currently, the only available vaccine for TB prevention is *Bacillus Calmette-Guérin* (BCG), which is given to babies soon after birth in some countries. The vaccine was first administered to human beings in 1921 and provides good protection against TB for younger children and against severe forms of TB, but it has its limitations. BCG doesn't protect very much beyond early childhood. It does not protect adolescents and adults who account for the majority of TB transmission—certainly not to the extent that we would like.

In a monumental stride towards tuberculosis (TB) eradication, scientists have developed around 15 vaccine candidates are being developed in the battle against tuberculosis to compensate for the poor efficacy of the *Bacillus Calmette-Guérin* (BCG) vaccine. Three of these candidates are in phase 3 trials. Of these candidates, one of the most promising has been shown to be 50% effective in adolescents and young adults, which is an exceptional outcome for a population that is poorly protected by the BCG vaccine.

The TB vaccine candidate pipeline includes various vaccine platforms including whole cell vaccines, adjuvanted proteins, and recombinant subunit vector vaccines. Candidate vaccines are being developed for prevention of TB disease in adolescents and adults, for early life immunization as BCG replacement, as BCG



boosters, for vaccination of TB patients after treatment to prevent disease recurrence, or as immunotherapeutic adjuncts to drug therapy intended to reduce treatment duration.

One of the challenges in TB vaccine studies, is that researchers are still working out what all the correlates of immunity are – in other words, the measurable signs that a person is protected against becoming infected and/or developing the disease. The actual immune marker work is still ongoing, and the study hopes to contribute to identifying what the immune response would look like, whether it results in protection from TB disease and how we can measure it.

A new TB vaccine M72/AS01E reigniting hope

A groundbreaking vaccine, (M72/AS01E) marking the first major advancement in TB prevention in a century which has the potential to save an estimated 8.5 million lives has been developed. This investigational TB vaccine candidate was found to be significantly protective against TB disease in a Phase IIb trial conducted in Kenya, South Africa and Zambia, in individuals with evidence of latent tuberculosis infection. The point estimate of vaccine efficacy was 50% (90% CI, 12-71), over approximately three years of follow-up.

What is the M72/AS01E vaccine candidate

M72/AS01E is a subunit candidate vaccine comprised of an immunogenic fusion protein (M72) derived from two *Mycobacterium tuberculosis* (M.tb) antigens (MTB32A and MTB39A), and the GlaxoSmithKline (GSK) proprietary adjuvant AS01E. AS01E is the same adjuvant used in Shingrix GSK vaccine, as well as in the new malaria vaccine RTS,S/AS01E.

Developer of M72/AS01E vaccine candidate

The M72/AS01E vaccine candidate was developed by the pharmaceutical company GlaxoSmithKline, in partnership with AERAS. AERAS was a not for profit organization based in the US, aimed at supporting tuberculosis vaccine research, funded by the Bill and Melinda Gates foundation, the UK Department for International Development (DFID), and other organizations. Current efforts are being coordinated by the Bill & Melinda Gates Medical Research Institute.

The clinical efficacy data of M72/AS01E till date

A phase 2b study has been conducted to evaluate the safety, immunogenicity and protective efficacy of M72/AS01E vaccine against pulmonary TB, as compared to placebo in HIV negative adults with latent TB infection living in high TB burden countries (South Africa, Kenya and Zambia) and aged 18-50 years.

STUDENTS' CORNER

STRESS MANAGEMENT TECHNIQUES FOR PHARMACISTS



Sakshi Mehra
B.Pharm,
VIII Semester

Introduction

Pharmacists play an important role in patient care and are essential to the healthcare system in medication administration and health education. However, the high expectations and fast pace of their work can expose individuals to substantial stress. Daily responsibilities include monitoring a large volume of prescriptions, ensure drug safety, provide patient counselling, and remain updated with the ever-changing medical knowledge and legislation. These obstacles can cause chronic stress, which, if not properly managed, can affect both their professional performance and personal well-being.

Pharmacists' mental health relies heavily on effective stress management. Increase job satisfaction and assure the highest levels of patient care. By using personalized stress management approaches, Pharmacists can acquire resilience and coping techniques that enable them to manage their demanding professions more efficiently.

Pharmacists can apply a variety of sophisticated stress management techniques:

1. Time Management

Prioritize Tasks: Use tools such as to-do lists and

planners, or using digital programs to rank work according to urgency and importance. Breaking down enormous projects into smaller, more achievable chores might help make them less stressful.



Schedule Breaks: Schedule short pauses Throughout the day, rest and rejuvenate. Even a five-minute break can drastically reduce stress and boost productivity.

2. Active Listening: Engage in active listening with your coworkers Effective Communication and patients. This reduces misunderstandings and helps build a supportive work environment.

Feedback and Support: Create an environment in which suggestions is valued and assistance is



easily available. Regular team meetings might assist to address issues before they become more serious.

3. Mindfulness and Relaxation Techniques

Deep Breathing Exercises: Deep breathing exercises can help relieve stress and promote relaxation. Techniques like the 4-7-8 approach (Inhale for four seconds, hold for seven seconds, then exhale for eight seconds.) Can be really effective.

Mindfulness Meditation: Add mindfulness meditation to your daily practice. Apps like headspace can provide brief, guided sessions. Making them suited for hectic schedules.

4. Physical Activity

Desk Exercises: Perform simple exercises at your desk, such as stretching or chair yoga. This can improve circulation and reduce muscle tension.

Active Commuting: If possible, walk or cycle to work to get some physical activity.

5. Continuous Learning

Professional Development: Attend conferences, training sessions, and conferences to stay up to date on industry trends. This can increase

confidence and alleviate tension caused by knowledge gaps.

Read and Research: Stay up to date on new advancements in pharmacy practice by reading professional publications and research articles on a regular basis.

6. Healthy Lifestyle Choices

Balanced Diet: Maintain a well-balanced diet that includes vegetables, fruit, protein-rich foods, and whole grains. Avoid consuming too much caffeine and sweets, which can raise stress levels.

Stay Hydrated: Consume plenty of water all day. Dehydration can result in weariness and increased tension.

Adequate Sleep: Aim for 7 to 9 hours of good sleep each night. Good sleep hygiene measures, such as sticking to a regular bedtime schedule and limiting your screen usage before bed, will help you sleep better.

Stress management is an important part of keeping pharmacists healthy and well. Because their job is so demanding, they must take an active approach to stress management. Pharmacists can reduce stress and increase resilience by practicing time management skills, clear communication, mindfulness techniques, physical activity, and seeking help. Continuous learning, setting limits, adopting a healthy lifestyle, employing technology, and constantly evaluating and changing their tactics are all beneficial to improve stress management.

Executing these strategies benefits not just individual pharmacists, but also the work atmosphere and the quality of care provided to patients. By emphasizing self-care and implementing a complete stress management strategy, Pharmacists may thrive in their positions, by ensuring that they can continue to provide the best quality of treatment in sustainable ways.



NANOSTRUCTURES FOR THE OCULAR DELIVERY OF NATURAL COMPOUNDS



Mr. Shyam Arora

B.Pharm

VI Semester

Introduction

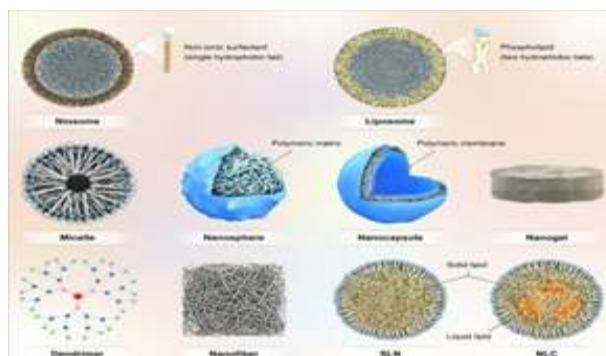
The anatomy and physiological characteristics of the eye makes it a unique sensory organ. Various chronic and acute diseases can affect the anterior and posterior segments of the eye. The most common chronic posterior segment diseases such as age-related macular degeneration (AMD), diabetic macular edema (DME), and diabetic retinopathy (DR) and some of the chronic anterior segment diseases such as glaucoma, uveitis, cataract, dry eye syndrome (DES) are the leading causes of vision loss. Conventional delivery systems such as eye drops, injections, and implants have been the most extensively utilized, but they have some disadvantages including challenges to traverse the physiological barriers, enzymatic drug degradation, protein binding, poor targeting efficiency, low penetration and retention time, side effects and low bioavailability. Nanocarrier(s) based drug delivery systems are designed to deliver the drug to the target site by delivering small molecules either by improving their permeation or by extending residence time, prolonging the drug release profile, and reducing the injection frequency.

Several nanomaterials have been explored to overcome ocular barriers and control the release of drugs. Even with the few available reports about the delivery of natural products,

nanoparticles as promising carriers could entrap these natural products to make a safe and more promising alternative for the remedy of ocular diseases through the ocular routes. The beneficial therapeutic effects of natural products have attracted a significant attention in the treatment and prevention of diseases. They are considered effective agents for the treatment and prevention of various ocular disorders such as glaucoma, cataract, corneal and choroidal neovascularization, AMD, DR, DES. Besides their beneficial effects, most of these natural products suffer from low water solubility and low bioavailability due to rapid enzymatic degradation that hinder their medical applications. Different techniques have been applied to overcome these limitations such as encapsulating flavonoids into polymeric carriers, covalent conjugation of flavonoids to hydrophilic polymers, such as dextran, poly (ethylene glycol) (PEG), poly (allylamine), and gelatin.

Nanotechnology introduces many novel nanocarriers for the treatment of ophthalmic disorders by modification and formulation of existing drugs that lead to an increase in the number of commercial nano-based drugs, in the ocular drug delivery area. In ocular drug delivery, the ability of NPs to adhere to an ocular tissue, mucosa, and epithelium is a major benefit and prevents the formulations from being washed

away immediately by ocular defence mechanisms. Various types of nanotechnology have been investigated to improve the ocular drug delivery. Nanostructured carriers have emerged as minimally invasive drug delivery systems, which can preserve therapeutic drug concentrations in the eye for extended times, reducing the need for frequent administration, and reducing the side effects. To date, various nanocarriers such as polymeric NPs, lipid NPs, liposomes, niosomes, micelles, dendrimers, and nanofibers have emerged as novel technologies to overcome ocular barriers and improve drug delivery of therapeutic drugs to target sites with enhanced ocular bioavailability. The small size



Various nanocarriers for ocular drug delivery

and adjustable physicochemical and functional properties provide advantages for delivering drugs to target sites.

Nanostructures in ocular drug delivery

Type of carriers	Drug/Carrier	Method of Preparation	Size (nm)	Advantages and Considerations
Lipoid nanoparticles (LNs)	Curcumin loaded in NLC Coated with chitosan-N- acethyl cysteine (NAC)	Melt-emulsification method	88.6	Topical administration in rabbit eye. Controlled release of drug for 72 h. Enhanced the retention time and corneal permeation with no toxicity and irritation
Micelles	Genistein in Micelle (MPEG-bPAE-modified with HA)	Diafiltration method	84.5	Topically instilled eye drops into the rabbit eyes. It was able to increase the retention time of formulation on the cornea thus enhance corneal permeation that leads to enhance the bioavailability of GEN.
Nanoparticles/ Polymeric nanoparticles	Quercetin loaded in Chitosan NPs modified with PEG (co-delivery with Resveratrol)	Ionic gelation Using TPP as a cross-linker	308-310	Eye drop instillation reduced the IOP in normotensive rabbits. This formulation shows sustained drug release profile with enhanced the corneal permeability and to reduce efficiently IOP in the glaucoma treatment
Liposome	Thymoquinone and Latanoprost in Liposome	Thin film hydration method	99.4–150	(TQ) and (LAT) encapsulated in liposomal vesicles indicated the IOP lowering efficiency in glaucomatous rabbit eyes.
Nanogel	Pilocarpine in Nanogel (polyvinyl pyrrolidone/poly acrylic acid) (PVP/PAAc)	Ionized radiation method	80–120	This formulation enhanced the stability, bioavailability, ocular retention time of pilocarpine. It showed sustained release profile for 24 h and reduced the frequency of administration.
Nanofiber	EGCG in SFNF	Electrospinning method	245	EGCG-SFNF with anti-VEGF properties and controlled release pattern for 6 days can be considered as a promising scaffold for corneal tissue engineering and delivery system

PLANT-BASED EDIBLE VACCINES: A CUTTING-EDGE CONCEPT TO IMMUNIZATION



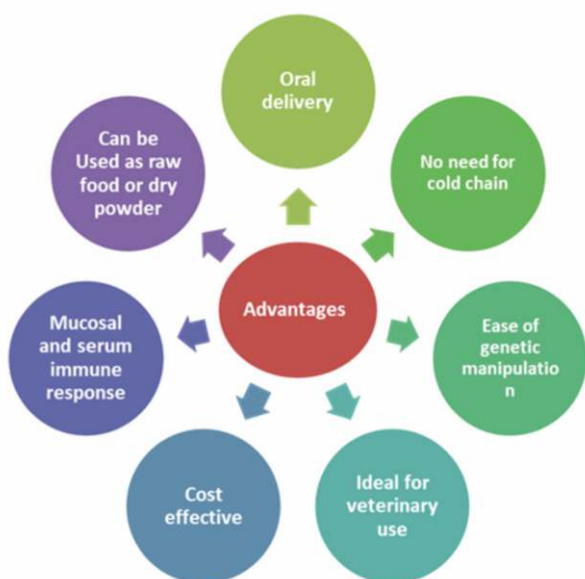
Ms. Roshni
Mr. Prince Kumar
B.Pharm
IV Semester

Vaccines have emerged as a promising medical intervention for immunoprophylaxis, particularly in developing countries, due to their cost-effectiveness. Injectable vaccines pose some difficulties, such as inconvenient administration, the need for regulated temperature from the production site to the user, and high costs. Therefore, plant-derived edible vaccines were discovered as an attractive alternative since they do not face these limitations. The idea of edible vaccines originated from a group of philanthropic organizations led by the World Health Organization (WHO), which launched the Children's Vaccine Initiative in 1990. This initiative aimed to develop vaccines that are safe, heat-stable, orally administered, and widely accessible. They suggested that these goals could be fulfilled by producing subunit vaccines in the edible tissues of transgenic crop plants. Plant-derived vaccines offer increased safety, envision low-cost programs for mass vaccination, and propose broader use for both human and veterinary purposes.

The introduction of modern molecular and biotechnological methods has resulted in the development of vaccines that comprise recombinant proteins derived from pathogenic viruses, bacteria, or parasites. These proteins are typically produced not by the pathogens

themselves, but by expression of the gene encoding the protein in a "surrogate organism." The term "plant-derived edible vaccines" refers to antigens produced in the edible parts of a plant, such as fruits, leaves, roots, or tubers. Vaccines expressed in non-edible plant tissues may also be orally administered after processing. The term "edible vaccine" may have created the misconception that individuals could grow and administer their own vaccines without the supervision of pharmaceutical and health professionals. In practice, plant-expressed vaccines will require some form of processing to produce uniform doses for administration by oral and other routes.

Additionally, not all plant-derived vaccine antigens are edible; some may be effective only when administered by the appropriate method (e.g., topically, intramuscularly, intraperitoneally, subcutaneously). Transgenic plants expressing antigens from pathogenic microorganisms offer many advantages as low-cost production and effective delivery systems for vaccines. This new technology might contribute to global vaccine programs and have a significant impact on healthcare in developing countries. The recent concerns over infectious diseases, including smallpox, anthrax, and plague, for their potential use in bioterrorism, highlight the economic and



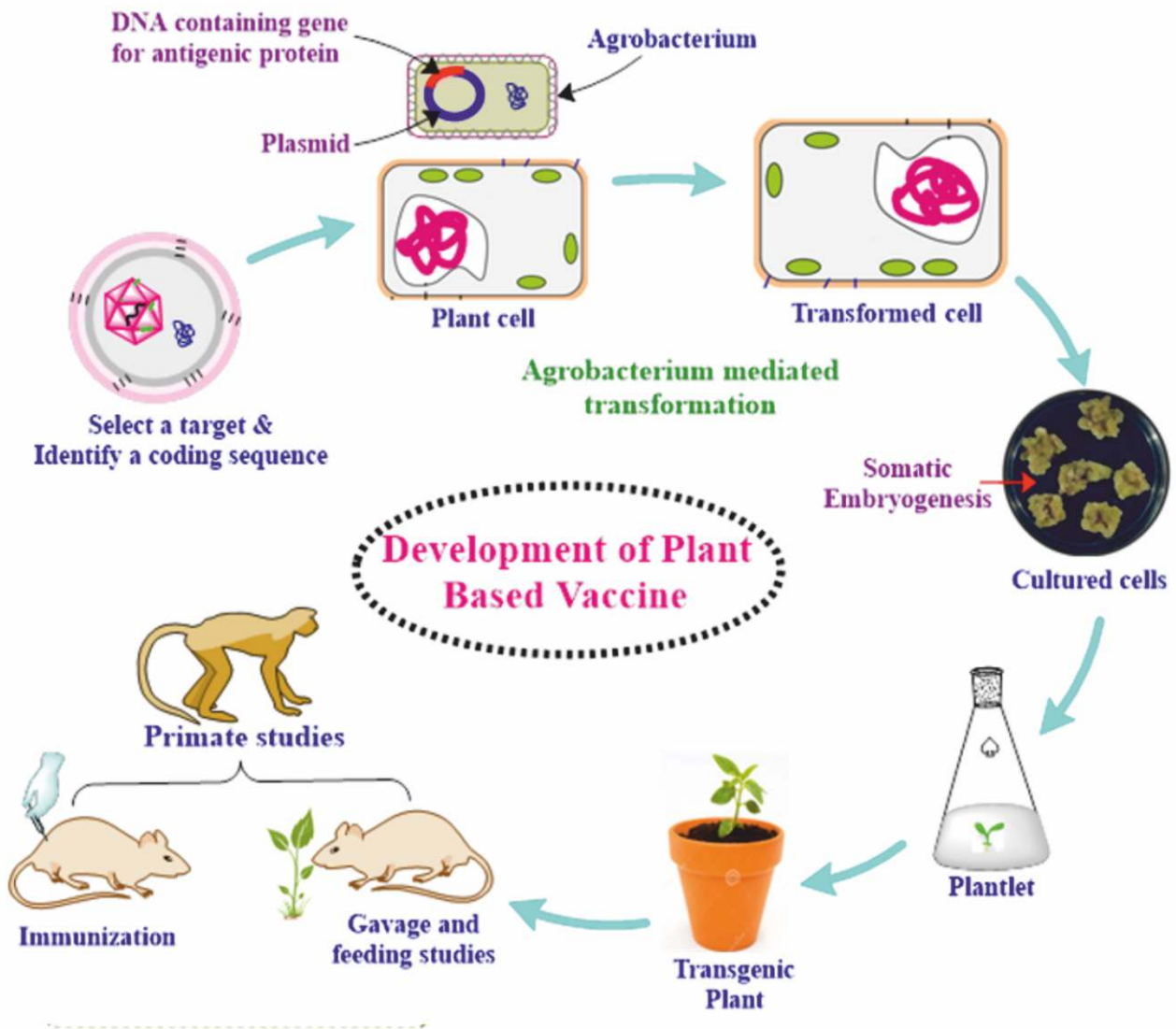
technical benefits offered by plant-derived vaccines as ideal substitutes for traditional vaccines.

In recent years, significant advances have been made in the development of innovative plant-derived vaccines using recombinant and genetic transformation technology. These new-generation vaccines have shown the ability to harness the body's immune system to combat infections, making them an excellent tool for mass prevention and disease control. Today, numerous new plant species are being developed using modern transformation technologies for better expression of recombinant proteins. These species include rice, potato, soybean, corn, banana, tobacco, and tomato. Scaling up the production of transgenic plants at a lower cost has been demonstrated for tobacco, soybean, and corn using established agricultural techniques. Another exciting possibility is using plants for mucosal delivery of the expressed antigens, which stimulates both systemic and mucosal immune responses.

This concept of oral vaccination has significant implications for inducing mucosal immune responses, which are the primary barrier against harmful pathogenic microbes present in food or water. Mucosal surfaces are the most common entry points for pathogens, where they initiate infectious processes. Immunologists are continuously working to ensure protection through these surfaces, as they constitute the first line of defense against infection. A vast amount of evidence has quickly accumulated in support of plant-derived antigens as effective, safe, and inexpensive means of acquiring or delivering a vaccine. The success of human trials with edible transgenic plant vaccines and successful challenges in animal studies has demonstrated the potential of plant-derived vaccines to expand the arsenal of preventative medicine. Edible plant-derived vaccines hold great promise, especially in developing countries where transportation costs, poor refrigeration, and needle use complicate vaccine administration. Edible vaccines, in particular, might overcome some of the difficulties associated with the production, distribution, and delivery of traditional vaccines. Significant challenges remain before vaccine crops can become a reality.

However, while access to essential healthcare remains limited in much of the world and the scientific community continues to struggle with complex diseases such as HIV and malaria, plant-derived vaccines represent a promising prospect. Strategies to improve recombinant protein yield in plants include the development of novel promoters, the improvement of protein stability and accumulation through the use of signals that target the protein to intracellular compartments, and the enhancement of downstream processing technologies.

ANIMAL FEEDING STUDIES





METFORMIN IN THE TREATMENT AND PREVENTION OF CANCER



Ms. Raghavi Bansal

B.Pharm
II Semester

Introduction

Metformin is a frequently prescribed medicine of the biguanide class due to its advantageous safety record and cost-effectiveness. For over sixty years, it has been employed to treat early-stage type 2 diabetes due to its exceptional ability to lower plasma glucose levels. Metformin has been shown to treat a range of diseases and may benefit ageing over time. Breast, endometrial, bone, colorectal, and melanoma cancers, obesity, liver, cardiovascular, and renal illnesses are among the conditions. Metformin, an FDA-approved medication for type 2 diabetes mellitus, has attracted the interest of researchers due to its anti-neoplastic characteristics. Metformin produces various effects through separate signalling systems. Several ongoing clinical trials are examining the efficacy of metformin in the treatment of cancer. However, a comprehensive understanding of the exact mechanisms and total scope of metformin's anti-neoplastic activity is still required.

Rational

Metabolic factors, such as obesity and hyperinsulinemia, have been associated with a heightened susceptibility to cancer. Conversely, epidemiological research has demonstrated that individuals with diabetes who use metformin have a reduced risk of acquiring cancer. Moreover, preclinical studies have shown the

anti-cancer characteristics of metformin and clarified its mechanism of action. Research conducted on live organisms and in the field of epidemiology has shown that metformin may have promise as a helpful medicine or adjunctive therapy for cancer. Metformin significantly inhibits the development of MDA-MB-231 cells by preventing their proliferation.

Mechanism

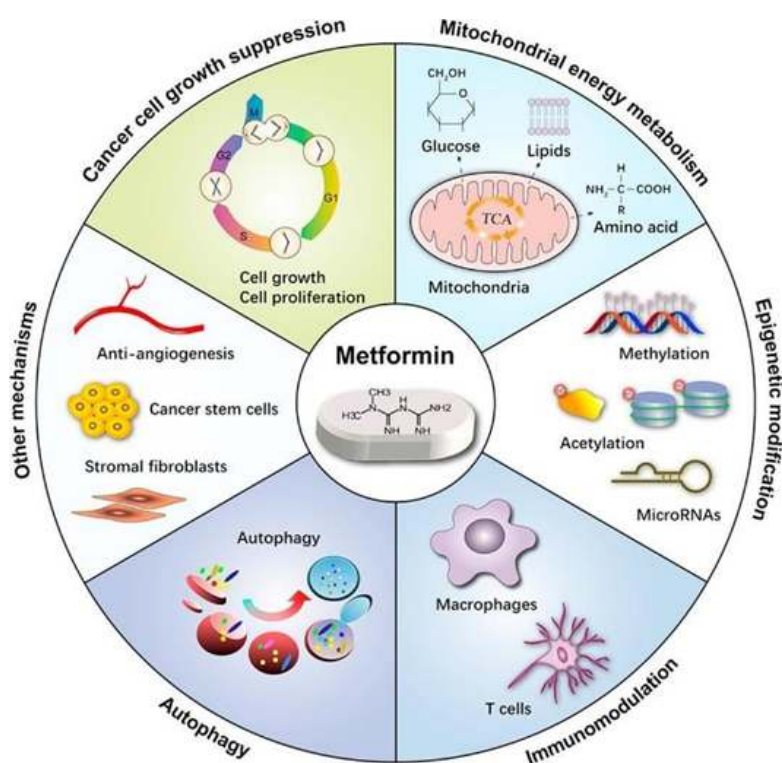
Metformin primarily works to inhibit the activity of mammalian target of rapamycin complex 1 (mTORC1), which contributes to its anticancer effects. The mTOR pathway plays a vital role in controlling the metabolism, growth, and multiplication of cancer cells. Metformin is thought to inhibit the mTORC1 pathway. The anticancer effect of metformin is believed to be associated with its systemic impact, characterized by a reduction in the levels of insulin and insulin-like growth factor 1 (IGF-1) in the bloodstream. Insulin/IGF-1 has a dual effect in regulating glucose absorption and promoting cancer development through the activation of the insulin/IGF receptor signalling pathway. Excessive consumption of food leads to an increase in the production of IGF-1 by the liver, which subsequently attaches to both the IGF-1 receptor and the insulin receptor. Afterwards, the signal is transmitted to phosphoinositide 3-kinase (PI3K) and Akt/protein kinase B (PKB)

through insulin receptor substrate (IRS), leading to the indirect activation (rather than phosphorylation) of mTORC1. Furthermore, the insulin receptor delivers signals to the Ras/Raf/ERK pathway via the growth factor receptor-bound protein 2 (GRB2), so stimulating cell proliferation.

There is data indicating that these pathways have a substantial impact on the changes in cellular metabolism that are distinctive of tumor cells. Increased levels of insulin/IGF1 in the bloodstream and the stimulation of insulin/IGF receptor signalling pathways have been demonstrated to contribute to the onset of several types of cancer. Metformin has been found to reduce insulin levels, impede insulin/IGF signalling pathways, and modify cellular metabolism in both healthy and malignant cells. The potential antitumor mechanisms of metformin are recognized as one benefit as follows: (a) Metformin induces cancer cell growth suppression; (b) Metformin regulates

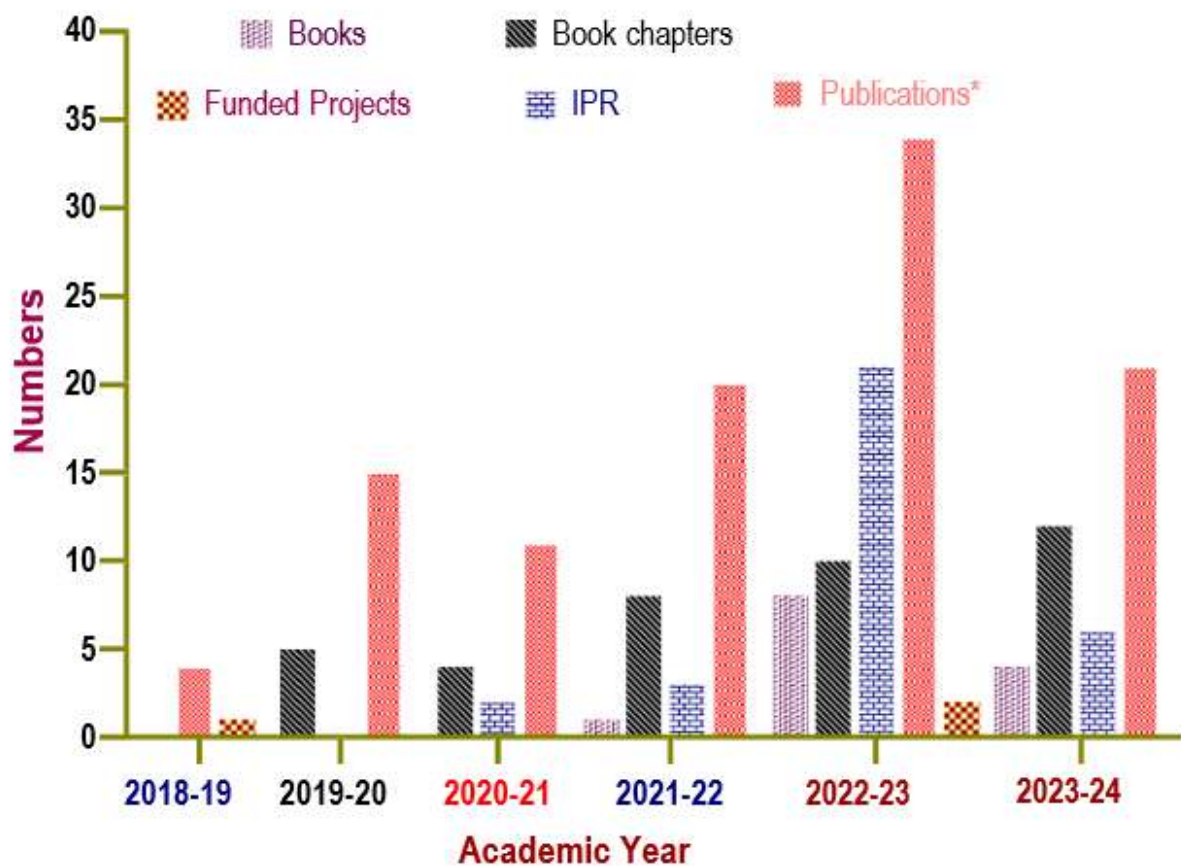
mitochondrial energy metabolism; (c) Metformin induces epigenetic modification; (d) Immunoregulatory effects of metformin; (e) Autophagy effects of metformin; (f) Anti-angiogenic effects of metformin and other anti-cancer pathways.

Metformin is the most common, affordable, and safe diabetes medication. It improves T2DM patients' prognosis and survival by reducing the risk of several cancers. In diabetes-associated cancer, metformin reduces hyperglycemia, hyperlipidemia, and hyperinsulinemia. It can also be cytostatic or cytotoxic. Adding metformin to other nonprescribed AMPK-activating drugs may enhance efficiency safely and affordably. Metformin may prevent metastasis before prescription due to recent findings that it and AMPK decrease CSCs/EMT. Including nondiabetic cancers, around 190 clinical trials are underway. These trials could revolutionise cancer prevention and therapy. We strongly anticipate nonprescription metformin cancer prevention.



Main anticancer mechanisms of action of metformin based on hallmarks of cancer

RESEARCH PROGRESSION



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RESEARCH PUBLICATIONS

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- Dr. Neeraj Mishra, Sumel Ashique, Ashish Garg, Nitish Kumar, Zuber Khan, Sourav Mohanto, Dinesh Kumar Chellappan, Arshad Faridh Farzad Taghizadeh-Hesary. A Critical Review on the Role of Probiotics in Lung Cancer Biology and Prognosis *Archivos de Bronconeumologia*, 2024, 1-11. (Impact Factor:8.0) (Elsevier)
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- A design patent on “Fluid Distribution Equipment in a Stomach” by Dr Pawan Kumar Gupta. Patent No. 379310-001.



- A copyright on "Role of Bacoppa Monnieri NLCS for the Management of Skin Ageing ". Registration No. L- 145651/2024 by Dr. Neeraj Mishra.
- A design patent on “Apparatus used for Noninvasive Monitoring of Hemoglobin in Blood” Patent No 406643- 001 by Dr Naveen Sharma. (Applied)
- A copyright on "Tofacitinib and Probiotics, prebiotic Loaded Enzyme dependent Microparticles for the Treatment of Inflammatory Bowel Disease". Registration No. L-149258/2024 by Dr. Neeraj Mishra, Dr. Vikas Pandey, Dr. Rajeev Sharma, and Ms. Mansi Jain.

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RESEARCH: FUNDED PROJECTS

(1) Name of the Funding agency:

MADHYA PRADESH COUNCIL OF SCIENCE AND TECHNOLOGY

- Name of the Principal Investigator: Dr. Ajay Sharma, Professor
Name of the Co-PI: Dr. Naveen Sharma, Professor
- Title of the Project: Biotechnological Approaches for Camptothecin Analogs Production from Cell Culture of Nothapoytes Nimmoniana: An Anticancer Medicinal Plant
- Date of Sanction: 28.07.2018
- Total Budget Sanctioned: 9.53 Lakhs
- Project Status: Completed

(2) Name of the Funding agency:

MADHYA PRADESH COUNCIL OF SCIENCE AND TECHNOLOGY

- Name of the Principal Investigator: Dr. Neeraj Mishra, Professor
- Name of the Co-PI : Dr. Vikas Pandey, Associate Professor
- Title of the Project: Dual functional colon- Targeted tofacitinib and probiotics loaded microparticles for the treatment of inflammatory bowel disease"
- Date of Sanction: 31.03.2023
- Total Budget Sanctioned: 3.2 Lakhs
- Project Status: Ongoing

(3) Name of the Funding agency:

MADHYA PRADESH COUNCIL OF SCIENCE AND TECHNOLOGY

- Name of the Principal Investigator: Dr. Rajeev Sharma, Assistant Professor
- Name of the Co-PI : Dr. Wasim Akram, Assistant Professor
- Title of the Project: "Ligand tethered polymer-lipid based self- assembled nanoconstructs for the effective brain targeting against glioma"
- Date of Sanction: 05.10.2023
- Total Budget Sanctioned: 6.20 Lakhs
- Project Status: Ongoing

MEDIA COVERAGE

ग्वालियर

ग्वालियर, शुक्रवार 12 अप्रैल, 2024

नवभारत

2

एमिटी में कार्डियोवैस्कुलर डिजीजेस, प्रिवेंशन, मैनेजमेंट एंड ट्रीटमेंट पर राष्ट्रीय सम्मेलन आयोजित

नवभारत न्यूज

ग्वालियर 11 अप्रैल, एमिटी यूनिवर्सिटी मध्य प्रदेश, ग्वालियर में कार्डियोवैस्कुलर डिजीजेस, प्रिवेंशन, मैनेजमेंट एंड ट्रीटमेंट विषय पर राष्ट्रीय सम्मेलन का उद्घाटन एमिटी विश्वविद्यालय के प्रो-चांसलर लेफ्टिनेंट जनरल वीके शर्मा (एवीएसएम) ने किया। प्रारंभिक उद्घोषण में उन्होंने बताया कि हृदय रोगों से बचने के लिए स्वस्थ जीवन शैली अपनाना चाहिए। नियमित रूप से व्यायाम करना और संतुलित आहार का सेवन करना जरूरी है। उन्होंने युवाओं से आह्वान किया कि तंबाकू और शराब से परहेज करें और समय-समय पर स्वास्थ्य की जांच कराएं।

सम्मेलन में मुख्य वक्ता डॉ. पुनीत रस्तोगी, हेड डिपार्टमेंट ऑफ कार्डियोलॉजी, जीआर मेडिकल क्लिनिक ग्वालियर ने

हृदय रोगों के विभिन्न पहलुओं पर महत्वपूर्ण जानकारी साझा की। उन्होंने कहा कि हृदय रोग भारत में मृत्यु का एक प्रमुख कारण है। उन्होंने बताया कि कोविड के बाद भारत में कोरोनरी आर्टरी डिजीज के सर्वाधिक, बीस प्रतिशत से अधिक मामले निरन्तर सामने आ रहे हैं, जो चिंता का विषय है। उन्होंने कहा कि हृदय रोग किसी भी उम्र में हो सकता है, वर्तमान दौर में युवाओं में हार्ट अटैक के मामले देखे जा रहे हैं।

डॉ. पुनीत रस्तोगी ने बताया कि दिल का दौरा एक गंभीर स्थिति है, और सभी प्रकार के दिल के रोगों में स्टेमो सबसे गंभीर है। स्टेमो दिल का दौरा तब होता है जब हृदय की धमनियों में से एक पूरी तरह से अवरुद्ध हो जाती है, जिससे हृदय को ऑक्सीजन नहीं मिल पाती है और मृत्यु का खतरा बढ़ जाता है। इससे हृदय की कोशिकाएं क्षतिग्रस्त हो जाती हैं और मृत्यु का खतरा बढ़ जाता है।



जता है।

डॉ. रस्तोगी ने स्टेमो का इलाज पर बिस्तर से जानकारी साझा की। उन्होंने बताया कि स्टेमो एक चिकित्सा अवस्था है। यदि आपको स्टेमो का संदेह है, तो तुरंत चिकित्सीय सहायता लेनी चाहिए। जिसकी जल्दी इलाज शुरू किया जाता है, उतना ही कम हृदय की क्षति होती है और मृत्यु का खतरा कम होता है। स्टेमो के उपचार में आमतौर पर अवरुद्ध धमनी को खोलने के लिए एंजियोप्लास्टी या बाईपास सर्जरी

और रक्त के थक्कों को रोकने के लिए दवाएं। हृदय को मजबूत करने और भविष्य के दिल के दौरों के जोखिम को कम करने के लिए दवाएं।

इस अवसर पर डॉ. रीतेंद्र झा प्रोफेसर एंड हेड डिपार्टमेंट ऑफ फार्मैकोलॉजी, ऑल इंडिया इंस्टीट्यूट ऑफ मेडिकल साइंसेज भोपाल ने संबोधित किया।

सम्मेलन में अन्य प्रमुख वक्ता डॉ. वरुण बंसल, रीबोर्टिक कार्डियक सर्जन, इन्द्रप्रस्थ

अपोलो हॉस्पिटल न्यू दिल्ली, और डॉ. नेहा बहारा हेल्थ केयर मैनेजमेंट प्रोफेशनल इंडियन हॉस्पिटल न्यू दिल्ली ने व्याख्यान दिया। इस मौके पर विशिष्ट अतिथि डॉ. प्रदीप कुमार प्रजापति, कुलपति डॉ. सर्वपल्ली राधाकृष्णन आधुनिक यूनिवर्सिटी जोधपुर ने व्याख्यान दिया।

इस कार्यक्रम में छात्रों द्वारा कई पोस्टर और मौखिक प्रस्तुतियां प्रस्तुत की गईं, इस कार्यक्रम को अध्यक्षता डॉ. एससी मेहता, डॉ. सरोज कोठारी (गजरा राजा

मेडिकल क्लिनिक ग्वालियर), डॉ. सीके अशोक (एमिटी यूनिवर्सिटी मानेसर) और डॉ. अर्पण लक्ष्मी (सीपीएसआरयू-नई दिल्ली) ने की।

समापन समारोह के अवसर पर प्रो. चांसलर लेफ्टिनेंट जनरल वीके शर्मा एवीएसएम रिटायर्ड ने संबोधित किया और राष्ट्रीय सम्मेलन का फार्मैसी स्टूडेंट्स के लिए महत्वपूर्ण बताया। सम्मेलन का सारांश डॉ. नवीन शर्मा द्वारा प्रस्तुत किया गया है कार्यक्रम का सभापन निदेशक डॉ. एस. मोहन लक्ष्मी द्वारा धन्यवाद ज्ञापन के साथ हुआ। इस अवसर पर प्रभारी कुलपति (डॉ.) अनिल वर्मा और इस सम्मेलन में फार्मैसी के सभी संकाय सदस्य विशेष रूप से उपस्थित रहे। सम्मेलन में चिकित्सा क्षेत्र के गणमान्य विशेषज्ञ और बड़ी संख्या में छात्र उपस्थित थे।

सुनील गोपाल



स्वदेश

ग्वालियर - मुख्य संस्करण

17 Apr 2024

एचई विभाग का अमला मौजूद रहा।

तरह नगर निगम ग्वालियर के लिए

कोरोनरी आर्टरी डिजीज को नजरअंदाज न करें: रस्तोगी

ग्वालियर। एमिटी विश्वविद्यालय में कार्डियोवैस्कुलर डिजीजेस, प्रिवेंशन, मैनेजमेंट एंड ट्रीटमेंट विषय पर राष्ट्रीय सम्मेलन का आयोजन किया गया। जिसका उद्घाटन संस्थान के प्रो-चांसलर लेफ्टिनेंट जनरल वीके शर्मा (एवीएसएम) ने किया। सम्मेलन में मुख्य रूप से मौजूद गजरा राजा चिकित्सा महाविद्यालय हृदयरोग विभागाध्यक्ष डॉ. पुनीत रस्तोगी ने कहा कि कोरोनरी आर्टरी डिजीज को नजरअंदाज नहीं करें, क्योंकि यह जानलेवा हो सकता है। उन्होंने बताया कि हृदय रोगों से बचने के लिए स्वस्थ जीवन शैली अपनाना चाहिए। नियमित रूप से व्यायाम करना और संतुलित आहार का सेवन करना जरूरी है। डॉ. रस्तोगी ने युवाओं से आह्वान करते हुए कहा कि तंबाकू और शराब से परहेज करें और समय-समय पर स्वास्थ्य की जांच कराएं।



डॉ. पुनीत रस्तोगी ने कहा कि कोरोनरी आर्टरी डिजीज को नजरअंदाज नहीं करें, क्योंकि यह जानलेवा हो सकता है। उन्होंने बताया कि हृदय रोगों से बचने के लिए स्वस्थ जीवन शैली अपनाना चाहिए। नियमित रूप से व्यायाम करना और संतुलित आहार का सेवन करना जरूरी है। डॉ. रस्तोगी ने युवाओं से आह्वान करते हुए कहा कि तंबाकू और शराब से परहेज करें और समय-समय पर स्वास्थ्य की जांच कराएं।

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