Azadi Ka Amrit Mahotsav

spark 2022

Department of Biotechnology

Ministry of Science & Technology, Government of India

Sponsored

NATIONAL CONFERENCE

Theme : Challenges & Opportunities in Drug Discovery Using Biotechnology

November 25-26, 2022

GURU GOBIND SINGH COLLEGE OF PHARMACY

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Preface

The National Conference (SPARK 2022) on the theme "Challenges and Opportunities in Drug Discovery Using Biotechnology" sponsored by the Department of Biotechnology, Ministry of Science & Technology (Govt. of India) was hosted by Guru Gobind Singh College of Pharmacy, Yamuna Nagar, Haryana, India. New biotechnology and drug discovery technologies are facilitating the rapid expansion of the clinical drug chest, empowering clinicians with a better understanding of disease as well as novel modalities for treating patients. This two-day national conference was focused on the recent advances in drug therapeutics, the challenges in drug discovery, and overcoming the issues in drug discovery and development using biotechnology. This strategic conference provided in-depth presentations and interactive sessions for attendees, offering the possibility to network with like-minded professionals and discussed how to overcome the current challenges and opportunities in drug discovery and development.

This national conference, SPARK (Sharing Pharmaceutical Advanced Research Knowledge) 2022 was held over two days, on the 25th and 26th of November 2022 (Friday and Saturday), and was hosted by Guru Gobind Singh College of Pharmacy. More than 800 students (UG and PG), research scholars, academicians, scientists, and industry professionals of different science disciplines (viz. pharmaceutical sciences, biotechnology, microbiology, medical sciences, biochemistry, natural products sciences, agriculture, chemical sciences, biological sciences, medical lab technology, and other science disciplines valuable for the development of pharmaceuticals and the sustainability of human health) participated in this conference. A total of 244 abstracts were received for the poster/oral presentation via the hybrid mode. All in all, the conference offered a truly comprehensive view while inspiring the attendees to come up with solid recommendations to tackle hot-topic challenges.

This national conference included altogether six technical sessions in which there were invaluable presentations by eminent speakers. The first technical session was delivered by Prof. (Dr.) Neelu Sood. She talked about "Biotechnology in Drug Discovery". The presentation highlighted about the importance of plant tissue culture and biotechnology in drug discovery. On the same day, in the second technical session, Prof. (Dr.) G.D. Gupta delivered a scientific talk on "Think and Do: Research in Pharmaceutical Sciences" and Prof. (Dr.) Rohit Dutt delivered a scientific talk on "Machine Learning in Drug Discovery". On the second day, in the first technical session, Prof. Shailesh Sharma delivered a scientific talk on "QBD in Biotechnology" and Prof. (Dr.) Viney Lather delivered a scientific talk on "Artificial Intelligence in Drug Discovery and Development" and highlighted the importance of AI in drug discovery. In the second technical session, Dr. Randhir Dahiya delivered a scientific talk on "In-silico Tools as Alternative to Animal Studies".

We would like to thank the Department of Biotechnology (DBT), Ministry of Science & Technology for the financial support. We sincerely thank the Guru Nanak Khalsa Education trust members, speakers, resource persons, committee members, reviewers, faculty members, non-teaching staff, and students of our college, who contributed magnificently to the success

of this conference. We are grateful to the speakers and the participants for their thought-provoking contributions. We extend our very best wishes to you wherever you may be around the world.

On the Behalf of Organizing Committee
Conference Chair

Message of the President

S. Randeep Singh Jauhar

It is heartening to know that Guru Gobind Singh College of Pharmacy, Yamuna Nagar is organizing a Two-Days National Conference SPARK 2022 on the theme **"Challenges and Opportunities in Drug Discovery using Biotechnology"** sponsored by the Department of Biotechnology on the 25th & 26th of November 2022.

The theme of the conference is of current interest and will serve as a common platform for discussing challenges and opportunities in drug discovery using biotechnology. In the modern drug discovery era, successful navigations through rational drug design are the keys to product longevity. This educational conference will provide a unique platform for scientific deliberation pertaining to discussing and applying recent research findings related to the emerging issue of drug discovery using biotechnology.

I welcome all the participants to the conference.

S. Randeep Singh Jauhar

President
Guru Nanak Khalsa Group of Educational Institutes,
Yamuna Nagar, Haryana, India

From the Desk of Principal

Prof. (Dr.) Kumar Guarve

It is indeed a matter of great delight to bring out the proceeding of the Two-Days National Conference SPARK 2022 on **"Challenges and Opportunities in Drug Discovery using Biotechnology"** which is being organized in our college. The theme of the conference was chosen keeping in view the present scenario of globalization and the vital role of pharmacists in these fields in the years to come. Many relevant topics pertaining to various aspects of the theme were deliberated by eminent scientists, who very kindly accepted our request and spared time for us out of their heavy work schedule. More than 800 delegates, who attended, were immensely benefited. I fail to find words to express my deep gratitude to these distinguished speakers. I would like to place on record my sincere gratitude to our worthy president and chief patron of the conference, **S. Randeep Singh Jauhar** for his keen interest, blessing, patronage and encouragement. I am also thankful to all members of the college and managing committee for their kind support.

Prof. (Dr.) Kumar Guarve

Principal
Guru Gobind Singh College of Pharmacy,
Yamuna Nagar, Haryana, India

From the Desk of Convener

Dr. Ashwani K. Dhingra

Guru Gobind Singh College of Pharmacy is putting all its efforts into establishing itself as a pioneer research institute worldwide working in the area of drug development and drug delivery. This Two-Days National Conference SPARK 2022 on the theme **"Challenges and Opportunities in Drug Discovery using Biotechnology"** sponsored by the Department of Biotechnology on the 25th & 26th of November 2022, at Guru Gobind Singh College of Pharmacy, aims up in bringing eminent academicians, researchers, and industry personnel to share their research experiences in the area of drug discovery, drug delivery, bioinformatics and biotechnology. I extend my warm welcome to all the delegates who have come all the way for attending this conference. I would like to thank all the resource persons, who have agreed to spare their valuable time and come to share their experiences. It is my pleasure to highlight the worthy contribution and immense efforts of all the college members to make this National Conference a great success. In the end, I would like to thank the Department of Biotechnology (DBT) for the financial support.

Dr. Ashwani K. Dhingra

Convenor

From the Desk of Co-ordinator

Dr. Geeta Deswal

It is wonderful feeling of joy, pleasure and privilege to be a part of the organizing committee in the Two-Days National level conference held at Guru Gobind Singh College of Pharmacy, Yamuna Nagar on 25th & 26th November 2022. The theme of this conference **"Challenges and Opportunities in Drug Discovery using Biotechnology"** is the first of its kind organized successfully in the area and we are overwhelmed by the enthusiastic response obtained from all over the country. I wish to express my sincere gratitude to eminent speakers for giving their expert views on various aspects of Intellectual Property Rights. I am highly indebted to our worthy President **S. Randeep Singh Jauhar** for giving valuable support for making this conference a grand success.

I would like to thank the Department of Biotechnology (DBT), Ministry of Science & Technology for the financial support. I extend my thanks to the entire team at GGSCOP to make this event a great success. On behalf of the college and organizing committee, I wish to thank all our contributors and well-wishers.

Dr. Geeta Deswal

Co-ordinator

PROGRAM SCHEDULE

Day 1: November 2022

S/N	Event	Time
1	**Registration**	09:00-10:00 AM
2	**Inaugural session**	
	Start of inaugural by Dr. Priyanka Kriplani	10.00-10.10 AM
	Lightening of lamp	10:10-10:20 AM
	Saraswati Vandana	10:20-10:30 AM
	Welcome by token of love	10:30-10:40 AM
	Welcome speech by Prof. (Dr.) Kumar Guarve	10:40-10:50 AM
	Speech by the Guest of honor of the day	10:50-11:10 AM
	Speech by the Chief guest of the day	11:10-11:20 AM
	Release of Souvenir by dignitaries on the dais	11:20-11:30 AM
3	**Tea break for guest**	11:30-12:00 PM
4	**Poster/oral presentation (Seminar Hall-2, First floor)**	11:30 AM Onwards
5	**First technical session**	
	Prof. (Dr.) Neelu Sood	12:00-01:00 PM
	Principal, UCS, BPSMV, Khanpur, Haryana	
	Title: Biotechnology in Drug Discovery	
6	**Lunch break**	01:00-02:00 PM
7	**Second technical session**	
	Prof. (Dr.) G. D. Gupta	02:00-03:00 PM
	Director-cum-Principal, ISF College of Pharmacy, Moga, Punjab	
	Title: Think and Do: Research in Pharmaceutical Sciences	
	Prof. (Dr.) Rohit Dutt	03:00-04:00 PM
	Dean, G.D. Goenka University, Gurugram, Haryana	
	Title: Machine Learning in Drug Discovery	
8	**Tea Break**	04:00-04:30 PM
9	**Cultural events**	04:30-06:00 PM

Day 2: 26 November 2022

S/N	Event	Time
1	**Day 2**	
	Start of session by Dr. Priyanka Kriplani	10.00-10.10 AM
	Welcome by token of love	10:10-10:20 AM
	Welcome speech by Prof. (Dr.) Kumar Guarve	10:20-10:30 AM
	Speech by the Guest of honor of the day	10:30-10:50 AM
	Speech by the Chief guest of the day	10:50-11:00 AM
2	**Tea break for guest**	11:00-11:30 AM
3	**First technical session**	
	Prof. (Dr.) Shailesh Sharma Director-cum-Principal ASBASJSM College of Pharmacy, Bela, Punjab **Title: QbD in Biotechnology**	11:30-12:30 PM
	Prof. (Dr.) Viney Lather Professor AMITY University, Noida, Uttar Pradesh **Title: Artificial Intelligence in Drug Discovery and Development**	12:30-01:30 PM
4	**Poster/oral presentation (Seminar Hall-2, First floor)**	11:30 AM Onwards
5	**Lunch break**	01:30-02:00 PM
6	**Second technical session**	
	Dr. Randhir Dahiya Associate Professor Central University of Punjab, Bathinda, Punjab **Title: In-Dilico Tools as Alternative to Animal Studies**	02:00-03:00 PM
7	**Interaction of delegates with industrial professionals**	03:00-04:00 PM
8	**Tea Break**	04:00-04:30 PM
9	**Valedictory session**	
	Prize distribution	04:30-05:00 PM
	Conclusive conference report by the coordinator	05:00-05:15 PM
	Vote of thanks by the convenor	05:15-05.30 PM

SCIENTIFIC TALKS

S-1

Biotechnology in Drug Discovery

Dr. Neelu Sood

University Campus School, Bhagat Phool Singh Mahila Vishwavidyalaya,

Khanpur Kalan, Gohana, Haryana, India

Plant drugs are gaining popularity and acceptance for the past two decades. World-over holistic medication is being practised to fulfil the ‘Health for all’ mission of the World Health Organization (W.H.O.) Plant drugs are safer to use and ethnomedicinal knowledge is shared easily amongst people. In order to use plant constituents as drug molecules uniformity in Bioactivity and a constant supply of plant material needs to be standardized. Plant Tissue culture can be used as a useful tool for raising elite herbal material in vitro. Using suspension cultures along with elicitation material can be produced irrespective of season and plant species etc. Stock and plant can be raised in vitro. Various plant parts can be used to raise callus cultures and phytoconstituents can be extracted from it. Elite herbal plant material will lead to the standardization of biopharmaceuticals.

S-2

Think and Do: Research in Pharmaceutical Sciences

Dr. G.D. Gupta

I.S.F. College of Pharmacy, GT Road, NH-95, Ghall Kalan,

Moga, Punjab, India

The pharmacy profession is growing very fast in all directions, viz., academia, industries, production, marketing, artificial intelligence and the health profession. The profession is recognized throughout the world during the COVID-19 pandemic situation and recognized in the world. In those days, NAAC, NBA and many other professional agencies are highly focused on the quality of research and outcome-based education. The same concept of NEP-2020 gives more opportunities to students to grow in their life even, if they may change their program with the limited benefit of credit points. Considering all aspects, the role of students is the most important in the growth of any college or University. This presentation is prepared considering all aspects of students and their role in the teaching-learning process and research. Only the publication of research work is not sufficient for any academic system. It was found that role of students is very important in the growth of any unit because all policy is highly focused on the benefit of students. This is the right time to think and do as per your capability, dedication, compatibility, and sustainability with the concept of zero defects and zero effect on the environment and society. The role of students in academia, the role of students in research, innovation council, start-up, skill Vigyan, patenting and trade mark, intelligence thought process, Govt. policy for students, job opportunities in various sectors-India and abroad, growth of profession and role of NEP 2020 in pharmaceutical education are discussed in the scientific talk.

S-3

Bioinformatics Drug Design and Discovery

Dr. Rohit Dutt

School of Medical and Allied Sciences,

G. D. Goenka University, Sohna Gurgaon Road, Sohna, Haryana, India

Complex mechanisms including mutations in various proteins and pathways can cause human illnesses. With recent genomic advances, revealing the genetic basis of disease on a personalized level has become a realistic aim. In many situations, appropriate molecular targets for which approved medications already exist will be discovered, and the possible repositioning of these drugs to a new indication will be studied. Because existing medications have proven clinical and pharmacokinetic data, repositioning provides a faster method to drug discovery. The promise for the development of new treatments provided by precision medicine creates significant challenges in the development of new approaches. As a result, a vast amount of biological data has been collected in the recent years, originating from a wide range of sources, ranging from small individual research laboratories to the large worldwide organizations. Repositioning and personalized medicine both strive to increase the efficiency of the present drug discovery pipelines, which spend a lot of time and money developing novel treatments only to have them fail in the clinical trials due to ineffectiveness or side effects.

S-4

QbD in Biotechnology

Dr. Shailesh Sharma

Amar Shaheed Baba Ajit Singh Jujhar Singh Memorial College of Pharmacy,

Bela, Ropar, Punjab, India

Quality by design (QbD) is a process for designing and launching new product. In the life sciences space, these products may include pharmaceuticals, biotechnology products, medical devices, software solutions and other relevant tools. QbD is used to create a high-quality product that meets the customer's needs while reducing risk for the manufacturer. To this end, a key objective of QbD is to make sure all variability is identified, justified and addressed before the product goes to market. The goal of QbD for the end product to meet its predefined characteristics from the very beginning, by eliminating errors and other discrepancies. Quality by design benefits both the customer (who values safe and effective products) and the manufacturer (for whom quality and costs will be better understood and more predictable with a QbD approach). Combined with process analytical technology (PAT) tools, QbD promotes process control while ensuring the product quality attributes are achieved to the highest standard. In nut and shell, it was concluded that quality by design is a strategic process that ensures products perform the way they're supposed to- in terms of both safety and effectiveness. Well-described goals and comprehensive risk management are essential.

S-5

Artificial Intelligence in Drug Discovery and Development

Prof. (Dr.) Viney Lather

Centre for Pharmaceutical Chemistry and Pharmaceutical Analysis,

Amity Institute of Pharmacy, Amity University, Sector 125, Noida,

Uttar Pradesh, India

Artificial intelligence (AI) is a technology-based system of simulating human intelligence through computers. AI utilizes systems and software for collecting information, learning from input, developing independent decisions by using information, making possible or accurate predictions, and self-correcting. The discovery of new chemical entities starts with an acquaintance of knowledge about biological targets like receptors, enzymes, proteins, or genes. The different targets are implicated in the regulation of the biological processes in various diseases. The drug discovery process starts with target identification, target validation, hit and lead identification and lead optimization followed by the development phase in different clinical stages. Artificial intelligence can provide revolutionary insights into drug discovery by using the enormous data from genetics, proteomics and target biology that can advance the process of discovery and development. Pharmaceutical research and development make efforts to approach AI to improve drug discovery, reduce research and development costs, reduce the time and cost of early drug discovery and support predicting potential risks/side effects in late trials that can be very useful in avoiding traumatic events in clinical trials and ultimately clinical trials. Usually, drug development takes five years to go to trial, but the AI drug can reduce it to just 12 months. The rapid growth in machine learning algorithms and enormous biological and chemical data has led to enormous growth in the number of AI-based startups which are focused on drug discovery and development in the last decade.

S-6

In-Silico Tools as Alternative to Animal Studies

Dr. Randhir Dahiya

Department of Pharmacology, Central University of Punjab,

Bathinda, Punjab, India

Developing a new drug from raw molecule to the launch of a finished product is a complex process that takes 12-15 years and costs in excess of $1 billion. With the expansion of research and development in medical breakthroughs, more animals are being employed in research. Every year, millions of experimental animals are used all over the world. Most researchers generally hold that nonanimal experiments are adjuncts rather than alternatives to animal experiments. Studies that do not use animals can produce much valuable information, but they cannot completely replace the information gained from animal experiments. Only animals can demonstrate the effects of a disease, injury, treatment, or preventive measure on a complex organism. The pain, distress, and death experienced by animals during scientific experiments have been debated issues for a long time. Besides the major concern of ethics, there are a few more disadvantages of animal experimentation like the requirement of skilled manpower, time-consuming protocols, and high cost. This has forced the researchers to find ways to not only decrease the time involved in drug screening procedures but also decrease the number of animals used and also increase the humane care of animals. The term "alternatives" encompasses a range of options. In the research community, an alternative has been defined to mean reducing the number of animals used, refining experimental designs to lessen any pain or distress in animals, or replacing animals with other organisms or techniques. Increasingly over the last decade however we have seen that computational methods have been developed and applied to pharmacology hypothesis development and testing. These in-silico methods include the use of the available databases, QSAR, pharmacophores, homology models, network analysis tools, and other molecular modeling approaches. In silico methods are principally used along with the generation and support of in-vitro data to create the model and verify it. Such models have frequently been used in the discovery and optimization of novel molecules to find out the affinity for a target as well as to explore the ADMET properties as well as the physicochemical characterization of a novel compound.

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37	Maina Chouhan*, Lalit Singh Chauhan	Department of Pharmaceutical Sciences, Mohanlal Sukhadia University, Udaipur, Rajasthan, India	Formulation and Evaluation of Microspheres of SGLT2 Inhibitor
38	Sara Sharma, Ankush Kumar, Vishakha, Anjana Devi*	School of Pharmacy, Career Point University, Hamirpur, Himachal Pradesh, India	Biotechnology in Drug Discovery and Development
39	Anurag Chourasia	Quantum School of Health Science, Quantum University, Roorkee, Uttrakhand, India	Artificial Intelligence: A New Era in Drug Discovery
40	Vinay Sharma, Ankush Kumar, Anjana Devi*	School of Pharmacy, Career Point University, Hamirpur, Himachal Pradesh, India	Preclinical Drug Development
41	Shilpa Kumari[1]*, Sandhya Jaiswal[1], Anjoo Kamboj[2]	[1]Department of Pharmaceutics, Chandigarh College of Pharmacy, Landran, Mohali, Punjab, India [2]Department of Pharmaceutical Chemistry, Chandigarh College of Pharmacy, Landran, Mohali, Punjab, India	Nanocarriers in Ocular Delivery: A Review
42	Soumitra Sahana, Seema Brar, Alok Sharma*	Department of Pharmacognosy, ISF College of Pharmacy, Moga, Punjab, 142001, India	Standardization and Development of HPTLC Method from Skin Cream Formulation
43	Dharmender Jaglan	Glocal School of Pharmacy, Glocal University Saharanpur, Uttar Pradesh, India	The Methanolic Extract of Albizia odoratissima (AO) Bark Attenuated the Development of Diabetic Nephropathy in Rats
44	Manisha Rauthan*	Quantum School of Health Science, Quantum University, Roorkee, Uttrakhand, India	Fixed Drug Eruption: Pathogenesis and Diagnostic Tests

45	Vishal Singh, Ankush Kumar, Anjana Devi, Vishakha*	School of Pharmacy, Career Point University, Hamirpur, Himachal Pradesh, India	Understanding Tablet Defects in Commercial Transfer and Manufacturing
46	Ankit Changra*, Ashok Kumar, Shilpa Chanel, Esha Vatsa, Bharat Parashar	Faculty of Pharmaceutical Sciences, The ICFAI University, Baddi, Himachal Pradesh, India	Pharmacognostic & Pharmacological Profile of Herbal Medicinal Plant Caesalpinia pulcherrima
47	Abhishek Sharma*, Sushant	Faculty of Pharmaceutical Sciences, The ICFAI University, Baddi, Himachal Pradesh, India	Scenario of Microbiology in Pharmaceutical Industries
48	Divyanshu Pandey*, Navni Sharma	Faculty of Pharmaceutical Sciences, The ICFAI University, Baddi, Himachal Pradesh, India	Nanostructured Lipid Carriers: A Novel Targeted Drug Delivery
49	Isha Kaundal*, Swati Pal	Faculty of Pharmaceutical Sciences, The ICFAI University, Baddi, Himachal Pradesh, India	Mushroom: A Food and Medicine
50	Nandini*, Navni Sharma	Faculty of Pharmaceutical Sciences, The ICFAI University, Baddi, Himachal Pradesh, India	Nanosponge: A Novel Drug Delivery
51	Siya Thakur*, Swati Pal	Faculty of Pharmaceutical Sciences, The ICFAI University, Baddi, Himachal Pradesh, India	Coumarin: A Promising Anti-Bacterial Agent
52	Bhavangi Sharma*, Roshmi Ray	Faculty of Pharmaceutical Sciences, The ICFAI University, Baddi, Himachal Pradesh, India	The Evolving Scenario with Pharmacognosy
53	Bhumika Sharma*, Esha Vatsa	Faculty of Pharmaceutical Sciences, The ICFAI University, Baddi, Himachal Pradesh, India	Antidiabetic Drugs in Ayurveda
54	Chandan*, Roshmi Ray	Faculty of Pharmaceutical Sciences, The ICFAI University, Baddi, Himachal Pradesh, India	Dispute with Vaccines During Covid-19
55	Himani Thakur*, Esha Vatsa	Faculty of Pharmaceutical Sciences, The ICFAI University, Baddi, Himachal Pradesh, India	Nutraceuticals: A Need of Modern Era
56	Ishita Thakur*, Roshmi Ray	Faculty of Pharmaceutical Sciences, The ICFAI University, Baddi, Himachal Pradesh, India	Polypharmacology and Drug Discovery
57	Lovish Sharma*, Esha Vatsa	Faculty of Pharmaceutical Sciences, The ICFAI University, Baddi,	Ashwagandha: A Potentially Active Medicinal Herb

		Himachal Pradesh, India	
58	Muskan Marwha*, Roshmi Ray	Faculty of Pharmaceutical Sciences, The ICFAI University, Baddi, Himachal Pradesh, India	Challenges and Opportunities for a Respiratory Disease Intervention
59	Rittika*, Jasveer Kaur	Faculty of Pharmaceutical Sciences, The ICFAI University, Baddi, Himachal Pradesh, India	Transdermal Drug Delivery System
60	Summi Sultana*, Esha Vatsa	Faculty of Pharmaceutical Sciences, The ICFAI University, Baddi, Himachal Pradesh, India	Corona Virus: A Major Threat to Mankind
61	Priyanka Bhardwaj	Quantum School of Health Science, Quantum University, Roorkee, Uttrakhand, India	Wheat: A Review on Nutritional and Medicinal Properties
62	Madhavi*, Praveen K. Dixit, K. Nagarajan	KIET School of Pharmacy, KIET Group of Institutions, Ghaziabad, Uttar Pradesh, India 201206	A Comprehensive Review on Vitex trifolia
63	Lovepreet Kaur*, Mahak Pal, Ashwani K. Dhingra	Guru Gobind Singh College of Pharmacy, Yamuna Nagar-135003, Haryana, India	Role of Green Tea (Camellia sinensis) in Neuroprotection, Antiphotoaging, and Autophagy
64	Thakur Prava Jyoti, Seema Brar, Alok Sharma*	Department of Pharmacognosy, ISF College of Pharmacy, Moga, Punjab, 142001, India	Exploring Extraction Efficiency by Using Different Extraction Techniques from Emblica officinalis: An Industrial Perspective
65	Geetika, Seema Brar, Alok Sharma*	Department of Pharmacognosy, ISF College of Pharmacy, Moga, Punjab, 142001, India	Standardization of Chyawanprash: A Polyherbal Formulation
66	Kamalpreet Singh, Seema Brar, Alok Sharma*	Department of Pharmacognosy, ISF College of Pharmacy, Moga, Punjab, 142001, India	Scientific Approaches for Regulations of Phytopharmaceuticals in Different Countries: Perspectives in Clinical Research
67	Susmita Mitra, Seema Brar, Alok Sharma*	Department of Pharmacognosy, ISF College of Pharmacy, Moga, Punjab, 142001, India	Investigating Applications of Fourier Transform Infrared Spectrophotometry in Triphala Churna Analysis
68	Rina Das*,	M.M. College of Pharmacy, Maharishi	A Wonder Pharmacophore

	Dinesh Kumar Mehta	Markandeshwar (Deemed to be) University, Mullana, Ambala, HR, India	in Drug Discovery: Styrylquinoline
69	Priyanka Saini, Vipul Saini, Puneet Gaba, Kamal Sharma, Nidhi Gupta*	M.M. College of Pharmacy, Maharishi Markandeshwar (Deemed to be) University, Mullana, Ambala, HR, India	Flavanoids as Potential Anticancer Agents
70	Nidhi Gupta	M.M. College of Pharmacy, Maharishi Markandeshwar (Deemed to be) University, Mullana, Ambala, HR, India	Plant-Derived Natural Products for Breast Cancer Treatment
71	Gazala Noor*, Badruddeen, Juber Akhtar, Mohammad Ahmad, Mohammad Irfan Khan	Faculty of Pharmacy, Integral University, Lucknow, Uttar Pradesh, India	Overview of Current Advancement of Pharmaceutical Nanotechnology
72	Nivedita Vaid	Guru Gobind Singh College of Pharmacy, Yamuna Nagar-135003, Haryana, India	Commercial Biotechnological Expansion Using Artificial Intelligence Aspects
73	Manju Kharb	Baba Mast Nath University, Rohtak, Haryana, India	Preparation, Characterization and Evaluation of the Novel Co-Crystals of Cabazitaxel and Syringic Acid
74	Manju Bala, Anju Dhiman*, Munish Garg, Harish Dureja	Department of Pharmaceutical Sciences, Maharshi Dayanand University, Rohtak, Haryana-124001, India	Bioadhesive Drug Delivery System: An Overview
75	Vandana Singh*, Deepak Kaushik, Vineet Mittal	Faculty of Pharmaceutical Sciences, Maharshi Dayanand University, Rohtak, Haryana, India	Herbal-based Formulations for Treatment of Acne
76	Ujjwal Sanduja*, Srishti Vats, Yash Gera, Suhail Saini, Uditi Handa*, Sheetal Soni, Kumar	Guru Gobind Singh College of Pharmacy, Yamuna Nagar-135001, Haryana, India	Current Modernizes on Mucoadhesive Oral Film: A Split Toward Pediatric and Geriatric Patients

	Guarve		
77	Anmol Popli*, Bharat, Shivani Dhiman, Ajmer Singh Grewal	Guru Gobind Singh College of Pharmacy, Yamuna Nagar-135001, Haryana, India	A Review of the Molecular Docking of Phytoconstituents Having Antidiabetic Activity Targeting Dipeptidyl Peptidase-IV
78	Lavish Chhabra*, Madhu, Mansi, Ajmer Singh Grewal	Guru Gobind Singh College of Pharmacy, Yamuna Nagar-135001, Haryana, India	An Ingestible Self-Orienting System for Oral Delivery of Macromolecules
79	Mansi*, Madhu, Lavish Chhabra, Ajmer Singh Grewal	Guru Gobind Singh College of Pharmacy, Yamuna Nagar-135001, Haryana, India	Stem Cells Use in Vitiligo
80	Isheeta Pandita*, Sunidhi Chauhan, Sonali Singh*	Department of Pharmacy Practice, Chandigarh College of Pharmacy, Landran, Mohali, Punjab, India	A Smart Blood Delivery System for Antibiotics
81	Aanchal, Sarika Chaudhary, Chaitanay Vinayak Narayan, Ria Kaushik	I.T.S. College of Pharmacy, Ghaziabad-201206, Uttar Pradesh, India	An In Silico Study on Antidiabetic Activity of Bioactive Compounds in Reynoutria japonica
82	Ritika*, Varsha, Peeyush Kaushik, Kumar Guarve	Guru Gobind Singh College of Pharmacy, Yamuna Nagar, Haryana, India	Development of Analytical Method Validation for Sildenafil Citrate by UV Spectrophotometry
83	Deepali Tomar*, Sunil Jawla	Geeta Institute of Pharmacy, Geeta University, Panipat, Haryana	Artemisia vulgaris: Traditional Cure for Diabetes
84	Gurpreet*, Deepali Tomar, Sunil Jawla	Geeta Institute of Pharmacy, Geeta University, Panipat, Haryana	Pharmaceutical Nanotechnology: From the Bench to the Market
85	Tushar Wadhwa*, Deepali Tomar	Geeta Institute of Pharmacy, Geeta University, Panipat, Haryana	Traditional Chinese Medications for Alzheimer’s
86	Suraj Sukhla*, Deepali Tomar, Sunil Jawla	Geeta Institute of Pharmacy, Geeta University, Panipat, Haryana	Aquaporins as Diagnostic and Therapeutic Targets in Cancer
87	Deepti Mittal, Preety*	School of Pharmaceutical Sciences, Lingaya's Vidyapeeth, Faridabad, Haryana, India	Lung Cancer: Recent Development and New Frontiers

88	Preety, Deepti Mittal*	School of Pharmaceutical Sciences, Lingaya's Vidyapeeth, Faridabad, Haryana, India	Breast Cancer
89	Neeraj Jangir*, Madhu Jha	School of Pharmaceutical Sciences, Lingaya's Vidyapeeth, Faridabad, Haryana, India	HIV: Human Immunodeficiency Virus
90	Neeraj Jangir, Madhu Jha*	School of Pharmaceutical Sciences, Lingaya's Vidyapeeth, Faridabad, Haryana, India	Modern Therapeutics, Vaccines and Future Challenges in the Treatment of COVID-19
91	Siddhant Gautam[1], Akhil Bansal[1], Akash Jain[1]*, Jasmine Chaudhary[1], Nitin Gupta[2]	[1]M.M. College of Pharmacy, Maharishi Markandeshwar (Deemed to be University), Mullana, Ambala, Haryana [2]M.M.I.M.S.R, Maharishi Markandeshwar (Deemed to be University), Mullana, Ambala, Haryana	Drug Utilization Pattern of Angiotensin Receptor Blockers/ ACE Inhibitors in Hypertensive Patient in Tertiary Care Hospital
92	Ravish[1]*, Parichit[1], Jasmine Chaudhary[1], Akash Jain[1], Harita[2]	[1]M.M. College of Pharmacy, Maharishi Markandeshwar (Deemed to be University), Mullana, Ambala, Haryana [2]M.M.I.M.S.R, Maharishi Markandeshwar (Deemed to be University), Mullana, Ambala, Haryana	Epilepsy in Children: An Overview
93	Siddharth Kumar[1]*, Sudhir Mehta[2], Jasmine Chaudhary[1], Akash Jain[1]	[1]M.M. College of Pharmacy, Maharishi Markandeshwar (Deemed to be University), Mullana, Ambala, Haryana [2]M.M.I.M.S.R, Maharishi Markandeshwar (Deemed to be University), Mullana, Ambala, Haryana	Therapeutic Approaches of Diabetic Nephropathy
94	Sujanki Kumari*, Jasmine Chaudhary, Akash Jain	M.M. College of Pharmacy, Maharishi Markandeshwar (Deemed to be University), Mullana, Ambala, Haryana	Terminalia bellirica: An Overview
95	Jeetesh Sharma*, Jasmine Chaudhary, Akash Jain	M.M. College of Pharmacy, Maharishi Markandeshwar (Deemed to be University), Mullana, Ambala, Haryana	Sickle Pod: A Review

96	Priyanka*, Jaspreet Kaur, Akash Jain	M.M. College of Pharmacy, Maharishi Markandeshwar (Deemed to be University), Mullana, Ambala, Haryana	Myrica esculenta: An Overview
97	Janvi Khanna[1]*, Sudhir Mehta[2], Jasmine Chaudhary[1], Akash Jain[1]	[1]M.M. College of Pharmacy, Maharishi Markandeshwar (Deemed to be University), Mullana, Ambala, Haryana [2]M.M.I.M.S.R, Maharishi Markandeshwar (Deemed to be University), Mullana, Ambala, Haryana	IgA Nephropathy: An Insight Overview
98	Manish Kaushik[1,3]*, Aditi Kaushik[2], Jasmine Chaudhary[1], Akash Jain[1]	[1]M.M. College of Pharmacy, M.M. (Deemed to be University), Mullana, Ambala, Haryana [2]C.T. Institute of Pharmaceutical Sciences, C.T. Group of Institutions, Jalandhar, Punjab, India [3]School of Pharmaceutical Sciences, Lovely Professional University, Jalandhar, Punjab, India	Role of Terpenoids in the Management of Diabetic nephropathy
99	Abhishek Marwari[1,2]*, Jasmine Chaudhary[1], Akash Jain[1]	[1]M.M. College of Pharmacy, Maharishi Markandeshwar (Deemed to be University), University, Mullana, Ambala, Haryana [2]Vivek College of Technical Education, Bijnor, Uttar Pradesh, India	Miracle Plant Used in Management of Obesity
100	Ankita Beniwal*, Jasmine Chaudhary, Akash Jain	M.M. College of Pharmacy, Maharishi Markandeshwar (Deemed to be University), University, Mullana, Ambala, Haryana	Lipids: A Major Contributor to Diabetic Nephropathy
101	Manisha Bhatia	M.M. College of Pharmacy, Maharishi Markandeshwar (Deemed to be University), University, Mullana, Ambala, Haryana	Food Supplement as A Source of Antioxidants
102	Daksh Manan*, Manisha Bhatia, Jasmine Chaudhary, Akash Jain	M.M. College of Pharmacy, Maharishi Markandeshwar (Deemed to be University), University, Mullana, Ambala, Haryana	Flax Seed Emerging as A “Super Food”
103	Prerna Singh Jadaun*, Arvind	S.D. College of Pharmacy & Vocational Studies, Bhopa Road	Phytochemistry of Several Medicinal Plants

	Kumar, Bhuwanendra Singh, Vimal Kumar Bharti	Muzaffarnagar, Uttar Pradesh, India	
104	Vishal Dixit*, Varisha Anjum, Sapna Singh	School of Pharmaceutical Science, Lingaya's Vidyapeeth, Faridabad, Haryana, India	Mechanistic Approach for Treatment of Dengue Fever
105	Rupam Sharma*, Poonam Devi, Rishab Bhanot	Department of Pharmacy, Indus International University, Bathu, Una, Himachal Pradesh, India	Pyrrolopyrimidine: An Anti-cancer Scaffold and Insight into Structure-Activity Relationship- A Mechanistic Review
106	Simran*, Pallavi Duggal	Department of Pharmacy, Indus International University, Bathu, Una, Himachal Pradesh, India	Diabetes Mellitus – An Overview
107	Vikas Bhatia*, Pallavi Duggal	Department of Pharmacy, Indus International University, Bathu, Una, Himachal Pradesh, India	Diuretics: A Basic Outline
108	Rajat*, Pallavi Duggal	Department of Pharmacy, Indus International University, Bathu, Una, Himachal Pradesh, India	Ebola Virus: An Overview
109	Dimple*, Pallavi Duggal	Department of Pharmacy, Indus International University, Bathu, Una, Himachal Pradesh, India	Epilepsy: An Overview
110	Rohit Kumar*, Pallavi Duggal	Department of Pharmacy, Indus International University, Bathu, Una, Himachal Pradesh, India	Hyperlipidaemia: An Overview
111	Umesh*, Pallavi Duggal	Department of Pharmacy, Indus International University, Bathu, Una, Himachal Pradesh, India	Jaundice – Symptoms and Treatment
112	Pallavi Duggal	Department of Pharmacy, Indus International University, Bathu, Una, Himachal Pradesh, India	Pharmacovigilance: A Basic Outline
113	Abhishek Kumar*, Pallavi Duggal	Department of Pharmacy, Indus International University, Bathu, Una, Himachal Pradesh, India	Schizophrenia: A Review
114	Priyanka Devi*, Pallavi Duggal	Department of Pharmacy, Indus International University, Bathu, Una, Himachal Pradesh, India	Thyroid disorders: An Overview
115	Vikas Kumar*, Bhuwanendra	Shri Venkateshwara University, Gajraula, Uttar Pradesh, India- 244236	Preparation and Primary Characterization of Bovine

	Singh		Serum Albumin-Based Nanoparticle for Drug Delivery
116	Bhuwanendra Singh[1]*, Arvind Kumar[1], Vimal Kumar Bharti[1], Gazala Noor[2]	[1]S.D. College of Pharmacy & Vocational Studies, Muzaffarnagar, Uttar Pradesh, India- 251001 [2]Faculty of Pharmacy, Integral University, Lucknow, Uttar Pradesh, India- 226026	Nephrotoxic Repercussion of Phytomedicines: A Review
117	Kiran, Vandana Garg*, Saloni Kakkar	Department of Pharmaceutical Sciences, Maharshi Dayanand University, Rohtak, Haryana, India	In- vitro Evaluation of Anti-inflammatory Activity of Barley Grass
118	Piyush Bansal[1]*, Neha Sharma[1], Manpreet Kaur[2], Poonam Arora[1], Madhukar Garg[1]	[1]Chitkara College of Pharmacy, Chitkara University, 140401, Punjab, India [2]G.H.G. Khalsa College of Pharmacy, Gurusar Sadhar, 141104, Ludhiana, India	Cymbopogon: A Genus with Multifarious Potential
119	Jiten Verma[1]*, Manpreet Kaur[2], Parth Sharma[1], Lavish Vaid[1], Madhukar Garg[1]	[1]Chitkara College of Pharmacy, Chitkara University, 140401, Punjab, India [2]G.H.G. Khalsa College of Pharmacy, Gurusar Sadhar, 141104, Ludhiana, India	The Antioxidant Potential of Medicinal Herbs: An Update
120	Gavin Jaggi[1]*, Divyadeep Bishnoi[1], Lavish Vaid[1], Prerna Sarup[2], Madhukar Garg[1]	[1]Chitkara College of Pharmacy, Chitkara University, 140401 Punjab, India [2]Swami Vivekanand College of Pharmacy, Banur, 140601, India	Scientific Study Based on Plant Species as CNS Stimulant
121	Aastha Gulati[1]*, Amrik Kapoor[1], Sonia Pahuja[2], Vandana Saini[1], Madhukar Garg[1]	[1]Chitkara College of Pharmacy, Chitkara University, 140401 Punjab, India [2]Swami Vivekanand College of Pharmacy, Banur, 140601, Punjab, India	Mandate Study on Hepatoprotective Herbs
122	Amrik Kapoor[1]*, Aastha Gulati[1], Lavish Vaid[1], Ennus Tajjudin Tamboli[2], Madhukar Garg[1]	[1]Chitkara College of Pharmacy, Chitkara University, 140401, Punjab, India [2]Annasaheb Dange College of B. Pharmacy, Ashta, 416301, Maharashtra, India	Traditional Medicines for the Management of Diabetes

123	Shruti Dham*, Abhishek Kansay*, Peeyush Sharma, Prerna Sharma	Guru Gobind Singh College of Pharmacy, Yamuna Nagar-135003, Haryana, India	Liquisolid Technology: Recent Advancement and Application in the Development of Pharmaceutical Product
124	Abhishek Kansay*, Shruti Dham*, Khushi Sibbal*, Peeyush Kaushik, Prerna Sharma	Guru Gobind Singh College of Pharmacy, Yamuna Nagar-135003, Haryana, India	Formulation and Evaluation of Liquorice and Lemon Grass Lozenges
125	Rameshwar Dass[1,2]*, Meenakshi Bhatia[1]	[1]Guru Jambheshwar University of Science & Technology, Hisar, 125001, Haryana, India [2]Guru Gobind Singh College of Pharmacy, Yamunanagar, 135001, Haryana, India	Development of Floating Pellets using the Compression/Spheronization Method
126	Shivani*, Gurvirender Singh, Kavita	Institute of Pharmaceutical Sciences, Kurukshetra University, Kurukshetra, 136118, Haryana, India	Quercetin-Based Nanoformulation for Cancer Treatment
127	Reema Mitra[1,2]*, Amandeep Kaur[1]	[1]Chandigarh College of Pharmacy, Landran, Mohali, Punjab, India [2]University Institute of Pharma Sciences, Chandigarh University, Gharuan, Mohali, 140413, Punjab, India	Evaluation of the Renoprotective Potential of Antihistaminic Drug Mepyramine in STZ-Induced Diabetic Nephropathy in Rats
128	Madhaw Dwivedi[1]*, Sanjay Gandhi[2], Kalpesh Gaur[1]	[1]Geetanjali Institute of Pharmacy, Geetanjali University, Udaipur, Rajasthan, India [2]Geetanjali Cardiac Centre, Geetanjali Medical College & Hospital, Udaipur, Rajasthan, India	An Observational Study in CABG Patients
129	Rishab Bhanot*, Gajender Singh	School of Pharmacy, Carrier Point University, Hamirpur, Himachal Pradesh, India	Phosphodiesterase 7: An Emerging Target for Treatment of Inflammatory Disorders
130	Alka Yadav*, Vikramjeet Singh	Department of Pharmaceutical Sciences, Guru Jambheshwar University of Science and Technology, Hisar, 125001, Haryana, India	Role of Thiazolidine-2,4-dione Analogues in Treatment of Various Physiological Disorders
131	Manish*,	Department of Pharmaceutical	Biological Potential of 2-

	Vikramjeet Singh	Sciences, Guru Jambheshwar University of Science and Technology, Hisar, 125001, Haryana, India	Amino Benzothiazole Derivatives: A Review
132	Ayush*, Chander Mohan, Rohit Kamboj	Guru Gobind Singh College of Pharmacy, Yamunanagar, 135001, Haryana, India	Antidiabetic Activity of Aloe vera
133	Himanshu Singh*, Raj Kumari, Meenakshi Sharma	I.T.S. College of Pharmacy, Murad Nagar, Ghaziabad, Uttar Pradesh, India	Histamine and Autocoids and their Role in Immunity
134	Shivam Dhaka*, Raj Kumari, Meenakshi Sharma	I.T.S. College of Pharmacy, Murad Nagar, Ghaziabad, Uttar Pradesh, India	Role of NSAIDS in Rheumatoid Arthritis
135	Dheeraj Sahu*, Raj Kumari, Meenakshi Sharma	I.T.S. College of Pharmacy, Murad Nagar, Ghaziabad, Uttar Pradesh, India	Role of Omega-3 Fatty Acids in Heart Disease Prevention
136	Kartik*, Shivanki Joshi, Aakriti Saini	Guru Gobind Singh College of Pharmacy, Yamuna Nagar-135003, Haryana, India	Cardiovascular Effects of COVID-19 Infection and Immunization
137	Astha*, Raj Kumari, Meenakshi Sharma	I.T.S. College of Pharmacy, Murad Nagar, Ghaziabad, Uttar Pradesh, India	Treatment of Diabetes Mellitus by Medicinal Plants
138	Pratibha Sharma[1]*, Pinki Phougat[2]	[1]Department of Pharmacy, Banasthali Vidyapith, Banasthali, Jaipur, Rajasthan, India [2]Department of Pharmaceutical Education and Research, Bhagat Phool Singh Mahila Vishwavidyalaya, Bhainswal Kalan, Sonipat, Haryana, India	Wound Healing Potential of Herbal Plants
139	Pinki Phougat[1]*, Pratibha Sharma[2]	[1]Om Sterling University, Hisar, Haryana, India [2]Department of Pharmaceutical Education & Research, Bhagat Phool Singh Mahila Vishwavidyalaya, Bhainswal Kalan, Sonipat, Haryana	Polyherbal Formulation: New Approach in Herbal Formulations
140	Vikramjeet Singh	Department of Pharmaceutical Sciences, Guru Jambheshwar	3-Hydroxy-2-Naphthoic Acid Derivatives and their

		University of Science and Technology, Hisar-125001, Haryana, India	Biological Potential
141	Ramesh J. Musale	Shri Jagdish Prasad Jhabarmal Tibrewala University, Vidyanagari, Jhunjhunu, Rajasthan, 333001, India	Need of Optimized Time-Dependent Drug Delivery System for Treatment of Gastric Acid Diseases
142	Prabhjot, Simran, Nikhil, Geeta Deswal	Guru Gobind Singh College of Pharmacy, Yamuna Nagar, Haryana, India	Diabetes Management: A Nutraceutical Approach using Green Tea and Herbs
143	Prateek Sharma[1]*, Ajmer Singh Grewal[2], Sukhbir Singh[3], Rajat[4], Anju Goyal[4]	1Govt. Pharmacy College, Kangra at Nagrota Bagwan, Himachal Pradesh, India [2]Guru Gobind Singh College of Pharmacy, Yamuna Nagar, Haryana, India [3]M.M. College of Pharmacy, M.M. (Deemed to be) University, Mullana, Haryana, India [4]Chitkara College of Pharmacy, Chitkara University, Punjab, India	Benzamide Derivatives as Allosteric Glucokinase Activators: Recent Developments
144	Harshil Jagan, Kuldeep Choubisa, Jeetendra Jeenger, Madhaw Dwivedi	Geetanjali Institute of Pharmacy, Geetanjali University, Udaipur, Rajasthan, India	Drug Utilisation Pattern Evaluation and Comparison of Cariprazine and Risperidone in Psychosis Patients in Southern Rajasthan
145	Parneet Kaur[1]*, Rohan[1], Pranav Dogra[1], Shweta Sharma[2], Madhukar Garg[1]	[1]Chitkara College of Pharmacy, Chitkara University, 140401 Punjab, India [2]G.H.G. Khalsa College of Pharmacy, Gurusar Sadhar, 141104, Ludhiana, Punjab, India	An Overview on Phytochemistry and Pharmacology of Ocimum sanctum Linn.
146	Kavita Rani1*, Gurvirender Singh1, Shivani1	Institute of Pharmaceutical Sciences, Kurukshetra University, Kurukshetra, 136118, Haryana, India	Phytosomes as Anticancer
147	Sandeep K. Sagar*, Avantika, Mansi Aggarwal*, Komal	School of Pharmaceutical Sciences, IIMT University, Meerut, Uttar Pradesh, India	Lifestyle: The Genesis of Malady
148	Adnan Arif*, Mansi Aggarwal*,	School of Pharmaceutical Sciences, IIMT University, Meerut, Uttar	A Review on Aloe vera

	Komal	Pradesh, India	
149	Ravi Kumar[1]*, Nitish[2], Gaurav Kumar[3]	[1]S.D. College of Pharmacy & Vocational Studies Muzaffarnagar, Uttar Pradesh, India [2]S.R.M. University, Ghaziabad, Uttar Pradesh, India [3]Dr. KN Modi Collee of Pharmacy, Modinagar, Uttar Pradesh, India	Effect of Betulinic Acid in Experimental Model of Amyotrophic Lateral Sclerosis in Rats
150	Tanu*, Tushar, Rudraksh, Sweta Kamboj	Guru Gobind Singh College of Pharmacy, Yamuna Nagar, 135001, Haryana, India	Advancement in Treatment Strategies for Hemophilia
151	Khushi*, Abhinav Singhal, Ajmer Singh Grewal	Guru Gobind Singh College of Pharmacy, Yamuna Nagar, 135001, Haryana, India	Ingredients Used to Prepare Formulation for Thrombocytopenia
152	Jasdeep Kaur*	Guru Nanak Institute of Pharmacy, Dalewal, Hoshiarpur, Punjab-144208, India	Phytochemical Screening of Ocimum sanctum
153	Geeta Jangra[1,2]*, Anuj Malik[1]	[1]M.M. College of Pharmacy, M.M. (Deemed to be) University, Mullana, Ambala, Haryana, India [2]Institute of Pharmaceutical Sciences, Kurukshetra University, Kurukshetra, Haryana, India	Hydrogels Promote Wound Healing Better than Traditional Bandages/ Gauze
154	Rudraksh*, Tanu, Tushar, Benu Chaudhary, Sweta Kamboj	Guru Gobind Singh College of Pharmacy, Yamuna Nagar, 135001, Haryana, India	Trace Elements and Minerals in Aging and Age-Related Diseases
155	Sahil Kashyap*, Sweta Kamboj	Guru Gobind Singh College of Pharmacy, Yamuna Nagar, 135001, Haryana, India	Edible Vaccine: Current Status and Future Prospects
156	Vineet Mittal*, Ashwani Arya	Department of Pharmaceutical Sciences, Maharshi Dayanand University, Rohtak, Haryana, India	Pharmacological and Phytochemical Profile of Potential Medicinal Plant, Celastrus paniculatus Willd (Jyotishmati)
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ORAL PRESENTATION ABSTRACTS

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O-1

Curcumin Proniosomal Gel: Formulation, Characterization and *In Vitro* Evaluation

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Abstract: Proniosomes were prepared by using the conservation phase separation technique and were further incorporated in water-soluble bases like vanishing cream, hydrogel and polyethylene glycol (PEG) ointment base to improve their application. Vesicles were characterized for vesicle shape, size, entrapment efficiency, in-vitro release and stability studies. The anti-microbial and anti-oxidant properties of curcumin proniosomal gel were also evaluated. Span 60 as surfactant and 100 mg cholesterol concentration were found optimum, optimized formulation had a mean size of 1.50 ± 0.40 µm with an entrapment efficiency of 78.77 ± 0.89. *In vitro* drug release studies showed that the optimized proniosomal formulation exhibits sustained drug release over a prolonged period. The release profile was found to follow the Korsmeyer Peppas model (incorporated in the PEG base). The antimicrobial activity showed that the developed curcumin formulation was more active against gram-positive bacteria (Staphylococcus aureus and Bacillus subtilis) as compared to against gram-negative bacteria (Escherichia coli and pseudomonas aeruginosa). Curcumin showed a very good free radical scavenging activity as compared to antioxidant ascorbic acid when evaluated using DPPH assay and was comparable to that of marketed preparation "toxol". The results indicate that proniosomes can be designed as successful carriers for the topical delivery of curcumin.

Keywords*: Antioxidant activity, Anti-microbial activity, Curcumin, Niosomes, Proniosomes, DPPH assay.*

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O-2

Origanum majorana: An Overview

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Abstract: A perennial plant known as *Origanum majorana*, often called marjoram, sweet basil, or wild oregano, is grown all over the world for its flavour and aroma. Since ancient times, this herb has been used to treat a number of illnesses and was also maintained indoors to ward off pests. Its biological properties, which include antibacterial, antioxidant, antidiabetic, and antianxiety properties, are explained by its abundance in phytochemicals like thymol, carvacrol, tannins, hydroquinone, limonene, terpinene, camphene, flavonoids like diosmetin, luteolin, and apigenin. These phytochemicals are used in the food and pharmaceutical industries to incorporate natural ingredients into their products. Marjoram contains chemical compounds that are helpful in treating a number of conditions, including colds, coughs, headaches, diabetes, stomach infections, menstrual cramps, and joint difficulties. Additionally, its essential oils can be used in the food industry as a natural preservative to prevent food spoiling. The market offers a variety of marjoram preparations, including dried herbs, essential oils, marjoram tea leaves, liquid extract, and supplements. This article provides a thorough summary of the traditional use, phytochemistry, and pharmacological properties of sweet marjoram.

Keywords*: Oregano herb, Origanum majorana, Essential oils, Preservative, Aromatherapy, Pharmacological properties.*

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O-3

Phytochemistry and Therapeutic Properties of Some Medicinal Plants

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Abstract: Phytochemical constituents have the capability to interact with living tissue and provide a wide range of probable effects. They are secondary metabolites produced during the primary biosynthetic and different metabolic processes of growth and development. The use of traditional medicines of natural origin is being encouraged to treat chronic disorders, as synthetic drugs in such cases may cause unpredictable adverse effects. This paper examined the pharmacological activity of some medicinal plants as alternative medicine. In the present paper plants like *Catharanthus roseus* (L.), *Cannabis sativa* (L.), *Moringa oleifera* (Lam.) and *Tinospora cordifolia* (Willd) are discussed for their active pharmaceutical ingredients and their therapeutic use. Future guidelines for designing and conducting thorough trials to validate the utility of these phytochemicals alone or in combination with existing conventional medicines are suggested.

Keywords*: Phytochemicals, Pharmacological property, Medicinal plants, Herbal, Secondary metabolites.*

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O-4

Development and Optimization of Polymeric Nanoparticles of Genistein

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Abstract: Genistein is a naturally available soy isoflavonoid and is also known as a phytoestrogen. It possesses anticancer properties particularly for ovarian cancer as it is more susceptible to estrogens. Its antiproliferative and antioxidant properties make it suitable for the treatment of cancer. It suffers from the biggest disadvantage of being the BCS (biopharmaceutical classification system) class II drug, i.e., low solubility. It is hydrophobic in nature and therefore, due to this, it suffers from a low bioavailability problem. To circumvent this challenge, we developed PLGA-based polymeric nanoparticles containing genistein. PLGA is a biodegradable and biocompatible GRAS (generally regarded as safe) polymer. The polymeric nanoparticles were developed by the utilization of quality by design rules. The Response surface methodology-based Box Behnken design was used to optimize the formulations and the independent variables were polymer concentration, surfactant concentration and polymer-to-solvent ratio. The dependent variables were particle size, polydispersity ratio and entrapment Efficiency. The results were analyzed by two-way ANOVA (Analysis of variance) and 3-D surface plots were plotted to evaluate the results. It was concluded that the implementation of quality by design rules to optimization studies can improve the quality of product formulation.

Keywords*: Quality by design, QbD, Box Behnken design, Genistein, Nanoparticles, PLGA, Nanotechnology.*

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O-5

Umbelliferone Alleviates Symptoms of Chronic Fatigue Syndrome in Mice

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Abstract: Myalgic encephalomyelitis (ME) or chronic fatigue syndrome (CFS) is a lifestyle-related illness that impairs both physical and mental performance. Although the cause is mostly unknown, several multifactorial processes exist, including abnormalities in the mitochondrial aerobic route, hypothalamic-pituitary-adrenal (HPA) axis dysregulation, immunological hyperactivation, free radicals, pathogen infections, and central neurohumoral aberrations. Umbelliferone is a 7-hydroxycoumarin that has various pharmacological activities. CFS was induced by lipopolysaccharide (LPS, 1 mg/kg, i.p.) once on day 1 trailed by a forced swim (10 minutes) and continued for 21 consecutive times once each day. Umbelliferone (20 and 60 mg/kg, p.o.) and dexamethasone (standard drug, 0.5 mg/kg, i.p.) were given from the 1st to the 21st day. Immobility time was noted in the forced swim test (FST). Elevated plus maze, and open field tests were employed to assess animal behaviour. Plasma glucose and cortisol, lipid peroxidation, GSH levels and nitrite were determined in the whole brain. LPS and repeated forced swim sessions instigated symptoms of CFS such as memory deficit and depression and anxiety-like symptoms. Findings suggested that Umbelliferone shortened the immobility period of mice against CFS in FST. Umbelliferone improved ambulation, improved cognition, and had anxiolytic effects. In the CFS mouse model, umbelliferone therapy decreased blood cortisol levels, increased brain GSH, and decreased brain TBARS. Umbelliferone may therefore prove to be a beneficial therapy for CFS and associated behavioural anomalies.

Keywords*: Myalgic encephalomyelitis, Chronic fatigue syndrome, Umbelliferone, Coumarin derivative, Mice.*

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O-6

Ginkgo biloba - A Herbal Treatment for Dementia

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Abstract: Numerous plants have been utilized in traditional herbal therapy to treat age-related cognitive problems. A gradual neurological condition of the brain is dementia. It destroys key brain cells, impairing memory, thinking, and behavior. It is severe enough to have an impact on job, enduring hobbies, and social interactions. A lack of acetylcholine, free radicals, and inflammation of the brain tissue are recognized causes of dementia. It is a syndrome or collection of symptoms and indications that appear simultaneously and are caused by a brain disorder. It is a gradual deterioration of language, judgement, learning ability, reasoning, and direction. Dementia results from structural and functional changes, oxidative stress, calcium overload, glutamate-mediated excitotoxicity, cerebral ischemia, and energy failure. Ginkgo biloba is frequently used to treat vascular dementia, peripheral claudication, early-stage Alzheimer's disease, and tinnitus with vascular etiology. Ginkgo biloba, usually referred to as gingko or the maidenhair tree, is a species of tree that is indigenous to China, it belongs to family Ginkgoaceae. The effectiveness of ginkgo for treating dementia and cerebrovascular illness has been the subject of several experiments, and systematic reviews indicate the herb may help with dementia symptoms. Ginkgo is often well tolerated, but when used with warfarin, antiplatelet drugs, and some other herbal medicines, it can raise the risk of bleeding. Ginkgo biloba has been demonstrated in both preclinical and clinical trials to enhance cognitive abilities in impaired individuals and reducing anxiety under pathological conditions.

Keywords*: Ginkgo biloba, dementia, Alzheimer's disease, Dementia, Cognitive problems, Ginkgo.*

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Phyllantus niruri L.- A Herbomineral Treatment for Urolithiasis

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Abstract: The clinically validated benefits of herbs and herbal medicines, such as immunomodulation, adaptogenicity, and antimutagenicity, have sparked interest among the public. The misuse of synthetic medications, which increases the likelihood of dangerous drug responses, has also encouraged people to look to nature for secure treatments. The Euphorbiaceae family includes the plant *Phyllantus niruri L.*, often known as the stone breaker plant. Consuming *P. niruri*s risk-free and has no appreciable negative impact on the serum metabolic markers. In individuals with hyperoxaluria and hyperuricosuria, it enhances urine excretion of Mg and K, which significantly lowers urinary oxalate and uric acid. Urinary calculi were removed as a result of consuming *P. nirur*. According to studies, it is also useful for urinary tract problems such renal lithiasis, cramps, cystitis, and nephritis. The herb is well recognized for its hepatoprotective, anti-inflammatory, and analgesic effects. It has been demonstrated that *P. niruri* disrupts a number of steps of stone formation, lowering crystal aggregation, altering the shape and content of the crystals, and changing how the crystals interact with tubular cells, resulting in a reduction in endocytosis. The clinically advantageous benefits of *P. niruri* may be connected to the relaxing of the ureter, which aids in the removal of calculi or the clearing of fragments after lithotripsy, or to a possible decrease in the excretion of urinary crystallization. No adverse renal, cardiovascular, neurological or toxic effects have been detected.

Keywords*: Herbal medicines, Medicinal plants, Phyllantus niruri L, Pharmacological effects, Analgesic effect.*

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Anti-Arthritic and Anti-Inflammatory Activities of Discrete Sanative Plant

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Abstract: From the very beginning arthritis and inflammation have been the most common infirmities which cannot be healed utterly, the only way to live life in full blooms is to cure the prodromes. Thus, varied sanative plants were employed, so life could be made easier. The literature-based study was accomplished by thoroughly going through the textbooks, peer research and review papers. A complete description of the plant, testing methods, toxicity studies, mechanism of action and phytoconstituent effectiveness have been included in the review article. Many plants having discrete research reports have been listed with their distinct families. The study is crammed with all the necessary information about sanative plants used in different studies by different researchers. Many studies mainly focus on the oral route of drug administration; in the future, more research may be conducted to prepare medications by inhalation or by topical route. This review distinctly provides ample data to prove that all the sanative plants listed might be relief-giving in infirmities like arthritis and inflammation.

Keywords*: Anti-arthritic, Arthritis, Inflammatory disorders, Anti-inflammatory, Sanative plants.*

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O-9

Bionic Eye – Breakthrough in Healthcare

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Abstract: People having near or distance vision impairment estimated to be at least 1 billion globally that could have been prevented or has yet to be addressed. Uncorrected refractive error, cataracts, and diabetic retinopathy are the major causes of vision impairment and blindness. The most common age group suffering from vision impairment and blindness is over 50 years. The eye receives a light stimulus and transforms it into a nerve impulse, which runs along the optic nerve reaching the visual cortex and giving rise to visual sensation. The retina (rods and cones cells) transforms light energy into an electrical stimulus and transmits them to the brain through optic nerves to create vision. A bionic eye is a form of a neural prosthesis intended to restore lost vision or partially amplify existing vision. The bionic eye was developed in view of patients with vision loss due to the degeneration of photoreceptors like retinitis pigmentosa, and macular degeneration. Visual prosthetic implants are suitable for patients with defects in light processing functions (damage to the retina, macula, and optic nerve). But for patients who were born blind, it was not convenient to implant a bionic eye due to them not having well-developed optic nerves. The bionic eye consists of image sensors, radio transmitters, microprocessors, receivers, and retinal chips. This electronic system helps blind people to get back good vision. Bionic eyes have a computer chip located at the back eye and are linked to a small video camera built into glasses, which they wear. The camera's captured images are focused on the chip, which converts it into an electronic signal and sends it to the brain. Electrodes on the implanted chip cover these signals into electrical impulses to stimulate cells in the retina that connect to the optic nerve. These impulses are then passed down along the optic nerve to the brain's visual cortex, where they are interpreted as an image. The images produced by the bionic eye do not have high clarity, but they are good enough to recognize things/places.

Keywords*: Bionic eye, Sensors, Radio transmitters, Chip, Macular degeneration, Retinitis pigmentosa.*

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O-10

Antibiotic Resistance: A Major Concern

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Abstract: Antibiotics work by killing the bacteria or by making it hard for the bacteria to grow and multiply. Since the 1940s, antibiotics have been used as standard treatments for fighting dangerous bacterial infections. Yet the number of bacteria developing a resistance to antibiotics is increasing. Antibiotic resistance occurs when the medication loses its ability to kill bacteria. As a result, the organisms continue to grow and cause infection, even in the presence of the antibiotic. Some bacteria are naturally resistant to certain types of antibiotics, but most become resistant through a natural genetic mutation or by acquiring resistance genes from other bacteria. When bacteria mate, they transfer their resistance traits. Because bacteria can acquire many resistance traits over time, they can become resistant to different types of antibiotics. *Staphylococcus aureus* is a pathogen commonly found on the skin or in the nose of healthy people. Most of the time, these bacteria are harmless, but they can cause an infection when they enter a wound. This type of bacteria is resistant to many antibiotics, including methicillin. In medical centres, MRSA causes life-threatening bloodstream and surgical-site infections, as well as pneumonia. communicate with each other and exchange signalling chemicals (autoinducers) These autoinducers allow the bacterial population to coordinate gene expression for virulence, conjugation, apoptosis, mobility and resistance. If not overcome resistant organisms lead to treatment failure and increased mortality. Resistant bacteria may spread in the community. Threat to return to the pre-antibiotic era. According to a study, India was the largest consumer of antibiotics in the world with 12.9 × 10° units followed by China with 10.0 x 109 units and the USA was the third largest with 6.8 x 109 units. According to some estimates, 56524 neonates die each year from bacteria resistant to first-line antibiotics in India. Phage therapy can be given and use of the lytic enzymes found in mucus and saliva.

Keywords*: Antibiotics, Antibiotic resistance, MRSA, Autoinducers, Pneumonia Pre-antibiotic era.*

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Importance of 3D Printing in Pharmaceuticals: A Major Breakthrough

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Abstract: When compared with the other sectors, the year 2005 marked the rapid evolution of 3-dimensional printing technologies in the pharma sector with a huge potential in the dosage form designing and personalization of the medication. 3D printing (3DP) is an inexpensive additive manufacturing technique that builds a 3D object by successive layering on top of each other in a 2D fashion. The layering of the object in the process is controlled digitally in a computer-aided design (CAD). 3DP technologies have multiple pharmaceutical applications including formulation of precise and unique dosage forms, medical research, personalization of medicine, tissue engineering and surgical application. The major technological platforms of 3D printing researched on in the pharmaceutical sector include inkjet printing, binder jetting, fused filament fabrication, selective laser sintering, and stereolithography. The potential of 3D printing to produce drugs for precise measurement customized to specific patients' needs has shown the possibility of developing personalized medicines to novel dosage forms. The need for 3D printing is due to numerous advantages like tailored doses, rapid disintegration in the case of the SLS technique, incorporation of high doses and taste masking capacity. The different techniques used in 3D printing are powder-based (PB), semi-solid extrusion (EXT), fused deposition modelling (FDM), stereolithographic (SLA) and selective laser sintering (SLS). There are different difficulties related to the correct utilization of 3D imprinting in pharmaceuticals, which have a strong impact on the scope of this technology. Recent advancements in the field of 3D printing technology used in the pharmaceutical industry mainly focused on different techniques for the fabrication of different dosage forms.

Keywords*: Printing technology, 3D printing, Pharmaceuticals, Personalized medication, PB, Stereolithography.*

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O-12

The Clinical Relevance of Chronopharmacology in Healthcare

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Abstract: Rhythmicity is the most ubiquitous feature of nature. Circadian rhythms in the functions of the body are well established, e.g., in cardiovascular (blood pressure, heart rate, blood flow, etc.), pulmonary, hepatic and renal functions. Onset of diseases are not randomly distributed within 24 hours of a day. Chronotherapy involves altering the timing of medication administration to improve the overall control of a disease and to minimize treatment side-effects, and is an emerging concept in the field of therapeutics. Preliminary screening of new drugs for chronotherapeutic potential may be a way of enhancing quality use of medicines. Accordingly, the effects and/or pharmacokinetics of drugs can display significant daily variations. There is important role played by circadian clocks in the development of cancer and the therapeutic efficacy of anticancer agents. A number of circadian clock genes have been identified, which include transcription factors that regulate gene expression. Circadian rhythms of gastrointestinal motor and secretory function on the action of orally administered drugs. Most drugs exhibit more rapid absorption in the morning compared to the evening due, in part, the circadian alterations in gastric emptying. Gastric acid secretion and gastrointestinal toxicity to oral drugs also display circadian rhythmicity. These observations provide a rationale for use or avoidance of drugs based on time-of-day dosing considerations.

Keywords*: Chronotherapy, Chronopharmacology, Healthcare, Clinical aspects, Circadian rhythm.*

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O-13

Vitex trifolia- A Breakthrough in Anti-Arthritic Treatment

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Abstract: Since ancient times, medicinal plants have been utilized to treat a wide range of human diseases and are a rich source of novel therapeutics. *Vitex trifolia* is a member of the Verbenaceae family, most often found in coastal areas of Pacific Asia, including countries like China, Australia, Singapore, and India. This review article tries to give a thorough analysis of *Vitex trifolia*'s pharmacological properties, which typically include antioxidant, antinociceptive, anti-inflammatory and anticancer, fungicidal, bactericidal, wound healing, amenorrhea, hepatoprotective, mice repelling, anti-malarial, trachea-spasmolytic and insecticidal properties. Due to the presence of distinct components, every part of the plant benefited. Casticin, persinogenin, artemetin, luteolin, penduletin, vitexicarpin, and chrysisplenol are a few isolated and known flavonoids found in *V. trifolia*. According to reports, these flavonoids have anti-inflammatory properties. The fruit and leaves contain luteolin-7-O-b-D-glucuronide, luteolin-3-O-b-D-glucuronide, isoorientin, orientinluteolin-glucoside, vitricine, 3, 6, and 7-trimethyl quercetagetin vitexin, 5-methyl artemetin, and 7-desmethyl artemetin.

Keywords*: Vitex trifolia, Anti-arthritic, Anti-inflammatory, Phytochemistry, Pharmacological properties, Flavonoids.*

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Zebrafish: Biological Role and Significance

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Abstract: Zebrafish (*Danio rerio*) are small freshwater fish that are used as model organisms for biomedical research. Neuroglia, including microglia and astrocytes, is a critical component of the central nervous system (CNS) that interacts with neurons to modulate their activity, development, metabolism and signalling. Thus, a better understanding of the role of neuroglia in the brain is critical. Complementing clinical and rodent data, the zebrafish (*Danio rerio*) is rapidly becoming an important model organism to probe the role of neuroglia in brain disorders. With high genetic and physiological similarity to humans, zebrafish possess some common (shared), as well as some specific molecular biomarkers and features of neuroglia development and functioning. Studying these common and zebrafish-specific aspects of neuroglia may generate important insights into key brain mechanisms, including neurodevelopmental, neurodegenerative, neurodegenerative and neurological deficits. Here, we discuss the biology of neuroglia in humans, rodents and fish, its role in various CNS processes, and further directions of translational research into the role of neuroglia in CNS disorders using zebrafish models.

Keywords*: Danio rerio, Zebrafish, Mechanism, Neuroglia, Macroglia, Microglia, Rodents, CNS disorders.*

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O-15

Importance of QSAR in Drug Design

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Abstract: Quantitative structure-activity relationships (QSAR) have been applied for decades in the development of relationships between the physicochemical properties of chemical substances and their biological activities to obtain a reliable statistical model for the prediction of the activities of new chemical entities. the classical QSAR studies, affinities of ligands to their binding sites, inhibition constants, rate constants, and other biological endpoints, with an atomic, group or molecular properties such as lipophilicity, polarizability, electronic and steric properties (Hansch analysis) or with certain structural features (Free-Wilson analysis) have been correlated. QSAR studies can be used to design and identify new inhibitors de novo or to optimize absorption, distribution, metabolism, excretion and toxicity profile of identified molecules from various sources. QSAR as a tool is gaining increasing acceptance with medicinal chemists and researchers in the allied fields due to the increased understanding of the underlying science by which one can develop mathematical (QSAR) models in order to accurately predict the biological activity or potency of new or untested compounds. QSAR has the capability to prioritize ideas in lead optimization and virtual screening. New QSAR techniques include hologram-based QSAR (HQSAR) and group-based QSAR (G-QSAR).

Keywords*: QSAR, Drug design, Steric properties, Hansch analysis, Free-Wilson analysis, Lipophilicity, Polarizability.*

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QSAR Studies for Selective Serotonin Reuptake Inhibitors: A Potent Class of Anti-depressants

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Abstract: SSRIs are referred to as "second-generation" antidepressants. They selectively inhibit SERT (serotonin transporters) and are rated higher than TCAs (first-generation antidepressants). These categories of drugs are relatively safer and have better acceptability and are prescribed in anxiety, OCD, phobias and related disorders. The QSAR study was successfully carried out by using the software Discovery Studio on 71 Aryl-piperazine derivatives of SSR inhibitors using MLR, PLS and FFNN analysis. The significant model was generated and defined by the three best descriptors: Log P [whole molecule], no. of atoms and Lipole Y component. After performing Multiple Linear Regression (MLR) Analysis of the training set, numerical values were obtained as: s = 0.291738, F = 56.2112, r = 0.912255, r^2 = 0.832209, r^2 (CV) = 0.798978 which showed 79% variance in biological activity. The lower value of s (0.29) and high value of F (56.2112) showed a good internal predictive ability of the developed model. The model also signified a square correlation of 0.83 between descriptors and anti-depression activity. Similarly, for the test set obtained values were as follows: s = 0.319748, F = 56.6078, r = 0.838011, r^2 = 0.722262, r^2 (CV) = 0.650892. For comparing the results of MLR, perfect least square (PLS) analysis giving r^2 as 0.829 and 0.712 respectively for training and tests sets was performed. To confirm if our model follows a linear or non-linear relationship with the biological activity feed-forward neural network (FFNN) was performed with r^2 values as 0.836 and 0.804. The results for MLR and PLS were comparable to each other as the obtained values of r^2 training and test set were close to each other respectively which suggested that the series of compounds have biological activity and the model generated has good predictability and from FFNN it was suggested that the series of compounds follow non-linear relationship with the biological activity.

Keywords*: QSAR, Antidepressants, Selective serotonin reuptake inhibitors, SSRIs, MLR, PLS.*

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Effects of *Avipattikara Churna* and *Triphla Churna* on Histopathology and Oral Glucose Tolerance in Type -II Diabetic Wistar Rats

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Abstract: The aim of the present study is to formulate a polyherbal formulation whose formula is given in the Ayurvedic Formulary of India (AFI) and evaluate its antidiabetic potential in animals. The polyherbal formulation was prepared using the methanol extracts and aqueous extracts of the given parts of herbs in the AFI. The quality of the finished product was evaluated as per the World Health Organization's guidelines for the quality control of herbal materials. An acute toxicity study was performed for dose selection as per OECD 423 guidelines. The quality testing parameters of the polyherbal formulation were within the limits. The acute toxicity studies of the polyherbal formulation did not show any toxic symptoms in doses up to 2000 mg/kg over 14 days. The extracts of both formulations were evaluated for the in-vitro and in-vivo anti-diabetic study. The oral anti-diabetic activity of the polyherbal formulation (200 and 400 mg/kg, p.o.) was screened against intraperitoneal (i.p.) STZ (35 mg/kg) 15 min after i.p. administration of nicotinamide (200 mg/kg) continuously for 2 days, to induce diabetes mellitus in Wistar rats. The investigational drug was administered for 28 consecutive days, and the effect of the polyherbal formulation on blood glucose levels, lipid profile, body weight and Oral Glucose tolerance was studied at regular intervals. At the end of the study, the blood samples were collected from all the animals for biochemical estimation, the animals were sacrificed, and the kidney, liver and pancreatic tissues were collected for histopathologic analysis. Polyherbal formulations showed significant antidiabetic activity at 200 and 400 mg/kg, respectively, and this effect was comparable with that of glibenclamide.

***Keywords**: Streptozotocin, Diabetes, Glibenclamide, Nicotinamide, Avipattikara churna, Triphla churna.*

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A Review on Presently Available Anti-Malarial Treatments and Focus on *Artemisia annua* Dry Leaf Antimalarial Therapy

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Abstract: Since a lot of drugs that were used for the treatment of malaria have shown resistance to the Plasmodium species. Even the Artemisia combination therapy is not effective in certain cases. There is a need to look for some alternatives, which are effective in the clinical treatment of malaria and affordable for the general population. A therapy called *Artemisia annua* dry leaf antimalarial therapy (ALT) has recently been tested for its effectiveness against malaria and certain other infectious diseases. ALT has been shown to be effective against artemisinin-resistant malarial infections and its treatment is resilient to resistance development in animal model systems. This proves to be an effective alternative to presently available antimalarials. This review defines the characteristics of different species of malaria-causing parasites, their vectors, endemicity, and features of the disease development; followed by chemical, biological, and antimalarial properties of currently used antimalarials. The choices and methodologies of administration of antimalarials to adult, child, pregnant, and lactating women patients with acute and complicated malaria are described, followed by strategies to combat drug-resistant malaria. A special emphasis on the origin, empirical basis, evidence on clinical efficacy, and cost aspects of ALT is given, along with the focus on the possibilities of repurposing ALT as a treatment for a variety of autoimmune, metabolic, and cancerous diseases.

Keywords*: Malaria, Artemisia annua Dry leaf antimalarial therapy, Artemisinin, Currently used antimalarial drugs.*

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O-19

Jackfruit: An Ignored Golden Fruit

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Abstract: The scientific name for ignored jackfruit is *Artocarpus heterophyllus* belonging to the Moraceae family. From ancient times, it has been used in rural areas. Studies have suggested that jackfruit has a wide range of therapeutic properties and pharmacological actions including antioxidant, anti-inflammatory, antibacterial, anticarcinogenic, antifungal and hypoglycaemic properties. It includes a wide range of compounds including carotenoids, flavonoids, volatile acids, sterols and tannins. It can be useful in some of the human disorders and diseases like fever, boils, skin diseases, and wounds, and maintains good heart health. It is also known as the national fruit of Bangladesh. It is widely cultivated in tropical regions but is underused due to a lack of knowledge of its golden benefits in good health and well-being. The whole plant including its seeds, fruit, bark, roots, leaves and latex is used. Despite its numerous therapeutic qualities, it is being neglected due to a lack of knowledge about its nutritional value. Jackfruit is a very nutritious fruit due to its diverse bioactive profile. Innovative food formulations must be introduced for future prospective so that people can get benefit from the wide range of health benefits of jackfruit by using jackfruit products full of nutrition and good health.

Keywords*: Artocarpus heterophyllus, Moracea, Jackfruit, Hypoglycaemic, Pharmacological actions.*

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O-20

Mangiferin as Herbal Medicine with Diverse Therapeutic Activities: A Comprehensive Review

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Abstract: Mangiferin (2-D-glucopyranosyl-1,3,6,7-tetrahydroxy-9H-xanthen-9-one) can be extracted from higher plants as well as mango fruits and by-products (i.e., peel, seed and kernel). It has antioxidant, antibacterial, antidiabetic, antiallergic, hypocholesterolemic, anticancer and immunomodulatory activities. By altering the transcription process, it inhibits the activation of peroxisome proliferator-activated receptor isoforms. Mangiferin inhibits tumour necrosis factor expression, inducible nitric oxide synthase potential, proliferation, and apoptosis, and so protects against a variety of human malignancies, including lung, colon, breast, and brain tumours. It also protects against brain and breast cancers by decreasing enzymatic activity, metastatic potential, and activation of the catenin pathway by suppressing the expression of matrix metalloproteinase (MMP)-9 and MMP-7. It has the ability to prevent lipid peroxidation and hence give protection against various physiological risks. This review article would outline the various molecular targets of mangiferin, taking it into account as a potential polyphenol. The current review study focuses on an updated account of Patents produced on mangiferin's chemopreventive activity, apoptosis induction in cancer cells, putative antioxidative activities, and patent mapping of other relevant therapeutic features will also be covered.

Keywords*: Mangiferin, Polyphenols, Anti-infectious, Anticancer, MMP, Anti-inflammatory, Chemoprotective, Antioxidant.*

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POSTER PRESENTATION ABSTRACTS

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P-1

A Critical Overview on Pyrazole Heterocyclic Nucleus as a Versatile Scaffold in Antimicrobial Drug Design

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Abstract: In recent years, we have seen that various heterocyclic moieties represent the basic nucleus for a handsome number of drugs. Increasing resistance of microorganisms to clinically used antimicrobial drugs is the major cause of morbidity and transience throughout the globe. Therefore, the development of novel antimicrobial agents will always be in demand for medicinal chemists. The pyrazole ring system is a versatile heterocyclic compound which has 2 nitrogen atoms in the ring system at the adjacent position and is also known as azoles. Among all the heterocyclic compounds, nitrogen atom compounds frequently have the main outline in the vast pool of heterocycles and have the potential for biological properties. Because of the vast range of biological importance, the pyrazole ring paved the way for several synthetic routes in synthetic chemistry for pharmacological importance. Pyrazole derivatives constitute an important class of medicinal agents having widespread pharmacological activities such as antimicrobial, anti-inflammatory, antiviral, antitumor, anticonvulsant and antidepressant activities etc. Prompted by these observations, this review article is entitled to represent the antimicrobial potential of novel pyrazole derivatives to curb the menace of microbial resistance towards antibiotics to treat microbial infections effectively.

Keywords: *Antimicrobial activity, Antibacterial activity, Antifungal activity, Heterocyclic compounds, Pyrazole.*

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P-2

Non-Aqueous Based HPMC Transdermal Patch of Aceclofenac: In vitro Characterization

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Abstract: An effective substitution for conventional administration routes is transdermal medication delivery. The use of transdermal treatments to treat arthritis has increased significantly in recent years. The current study intends to stop aceclofenac from degrading in an aqueous environment to increase the drug's stability and effectiveness when used therapeutically to treat arthritis. The current study aims to create non-aqueous, hydroxypropyl methyl cellulose-based transdermal patches for aceclofenac that will improve patient compliance, increase therapeutic efficacy, decrease gastrointestinal side effects, and prevent substantial first-pass metabolism. By using a solvent evaporation approach, 18 different aceclofenac transdermal patch formulations, including HPMCK4M, HPMCK100M, and HPMCK15M, were created. The characterization of these prepared transdermal patches was done *in vitro*. DSC thermograms concluded that there is no interaction between the API and excipients. The mass, weight variation, flatness, moisture content, moisture uptake, folding endurance, thickness, medication content, and swelling tests of these transdermal patches were all assessed. Good *in vitro* physicochemical qualities could be seen in all of the improved formulations. The improved patch (P13) was chosen for *in vivo* studies based on the findings. To increase the stability and effectiveness of aceclofenac during its therapeutic use for arthritis, it can therefore be reasonably inferred that it can be made into nonaqueous transdermal matrix-type patches.

Keywords: *Aceclofenac, Non-aqueous, Transdermal formulation, Patch, Characterization, HPMC.*

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P-3

Nanobiotechnology in Drug Discovery, Development and Molecular Diagnostic

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Abstract: The current use of nanotechnology in drug research and development involves producing better diagnostic procedures, better medication formulations, and better drug delivery systems for disease therapy. Insufficient throughput, unreliable data, and other initial challenges are now starting to be overcome by technological advancements. Despite significant obstacles, this technology gives enormous optimism for the future. It plays the most significant role in a variety of biological applications, including medication delivery, gene therapy, biosensors, biomarkers, and molecular imaging. Furthermore, it results in improvements in this field. The primary research objective in this field will be the development of an early analytic method and a treatment with a drug that targets a specific disease. To increase production, speed up the medication discovery and development processes, and maintain market dominance, the pharmaceutical and biotechnology industries have invested billions of dollars in cutting-edge technologies. With controlled manipulation at the atomic, molecular, and macromolecular levels, nanotechnology refers to the development of novel science and technology. This discipline is currently undergoing steady development, and several previously incurable diseases could likely one day be treated using nanobiotechnology tools.

Keywords: *Nanotechnology, Drug Discovery, Biosensors, Drug Development, Biomarker, Diagnosis.*

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P-4

Drug Discovery and Development Using Biotechnology

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Abstract: The quantity and chemical variety of the compounds and targets that could be screened in a particular test were constrained by the long processing times and labour-intensive nature of traditional drug discovery techniques. Even though there are many thousands of different chemical structures, it is common for screening using this method to end after several years with no lead compounds identified, having only looked at a small portion of the available compounds. Drug discovery is hampered by this speed and scale restriction, which frequently limits the quantity and quality of lead compounds accessible for additional testing and development. High-throughput screening results in multiple "hits" in an upgrade to this method. The drug discovery process now includes a stage called hit-to-lead. Genomic, proteomic, ligand-receptor interaction, signal transduction, rational drug design, biochips, and microarray tools are significant research techniques and themes. Monoclonal antibodies, cancer vaccines, antisense strands, gene therapy, enzymes, and proteins are examples of emerging therapeutic classes. In this post, we go over these subjects and demonstrate how they might have an impact by providing a summary of some of the most exciting drugs currently being developed. Clinicians must get familiar with these trends if they plan to use these novel treatments.

Keywords: *Biotechnology, Drug classes, Drug development, Drug design, Genomics, Proteomics.*

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P-5

Quality by Design for Products Using Biotechnology

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Abstract: Quality by design is a term used to describe the systematic, scientific, and risk-based integration of quality into the design and development of biopharmaceutical compounds and manufacturing. The International Conference on Harmonization (ICH) Q8, Q9, and Q10 guidelines lay the groundwork for applying QbD at particular points in the product development process. Understanding patient demands and the unique product quality qualities that are connected to safety and efficacy is a crucial part of quality by design. The functional linkages between patient needs, product quality features, analytical capabilities, and the production process must therefore be understood at a fundamental level in order to apply QbD. Before determining the quality target product profile and the critical quality attributes necessary to satisfy those patients' needs, pharmaceutical product sponsors first identify the product requirements to satisfy patient needs. The sponsor uses this data to develop the molecule, manufacturing procedure, and control plan, ensuring that the target product quality is routinely met. The QbD technique can be kept up-to-date throughout the duration of the product's lifecycle to support innovation and ongoing improvement based on new knowledge and technological advancements. Through process characterization, scale-up, technology transfer, manufacture, and patient exposure to the product, this knowledge is developed during the development phase and expands with more manufacturing experience. This strategy promotes using prior products and processes as well as by giving the product to more patients.

Keywords: *Quality by design, Biotechnology, Harmonization, Characterization, Innovation, Improvement.*

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Formulation and Evaluation Aspects of Polymeric Micelles for Topical Drug Delivery

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Abstract: Development in delivery systems has encouraged the researcher to discover other routes, besides enteral and parenteral, for the delivery of drugs efficiently and effectively to the target site. Delivery of drugs to the skin exterior is constantly being explored for skin diseases because it offers a targeted approach. Skin delivery of drugs for the cure of skin disorders is given preference due to various benefits like no systemic toxicity and minimum contact of the drug to the normal tissues. But changes in skin penetration and its barricade properties with the disease condition make it hard to construct a competent skin delivery system. Nanocarriers may facilitate drug delivery by entrapping the drug because of its various advantages like it penetrate the hair follicle, interact with the skin's lipid, and create a depot form for sustained release at the target site. Micelles enhance the solubility of lipophilic drugs by entrapping them in their inner cores, although micelles also allow tissue penetration of the drug to the target site. Polymeric micelles have fascinated huge consideration in skin drug delivery their CMC is much lesser than classic micelles. Polymeric micelles range in size from 10-100 nm, which is the foremost strength of polymeric micelles, which ensure stability, sterility and long-term circulation in the blood.

Keywords: *Polymeric micelles, Skin, Novel drug delivery systems, Micelles, Nanocarriers, CMC.*

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Development and Evaluation of Nanoparticles of Coenzyme Q_{10}

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Abstract: Coenzyme Q_{10} is an important vitamin-like substance required for the proper function of many organs and chemical reactions in the body. Coenzyme Q10 also seems to have antioxidant activity. Because of the long side chain of the molecule consisting of 10 isoprenoid units, CoQ_{10} is extremely lipophilic and practically insoluble in water. Hence oral bioavailability of CoQ_{10} is very low. Therefore, to improve its dissolution rate and dispersion in an aqueous medium and physiological fluids we formulated CoQ_{10} nanoparticles. To improve the oral bioavailability of CoQ_{10} with poor absorption characteristics by formulating nanoparticles. The antisolvent precipitation technique is used for the preparation of drug (CoQ_{10}) loaded nanoparticles. Different stabilizers were used to stabilize the nanoparticles formed. The size of nanoparticles was determined by the dynamic light scattering technique. Drug loading was determined and the release of CoQ_{10} from the nanoparticles was determined by the dialysis membrane method. Particle Size of blank and drug-loaded nanoparticles was found to be (Z-average) 194.4 nm and 367.3 nm with PDI of 0.152 and 0.6 respectively. The Zeta potential of blank and CoQ10 (loaded) nanoparticles was found to be 88.9mV and 60.5mV, respectively. Drug loading of nanoparticles was found to be 96%. Drug release studies showed that in 12 hours % the drug release of CoQ_{10} from the prepared nanoparticles was 68.02%.

Keywords: *Coenzyme Q_{10}, CoQ_{10}, Bioavailability, Nanoparticles, Anti-precipitation, Zeta potential.*

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Coumarin: A Review on Structure-Activity Relationship and Anti-Bacterial Activity

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Abstract: Naturally occurring coumarins with wide-ranging properties create innovative synthetic and semi-synthetic coumarin-based therapeutic medicines, such as those with antibacterial, anti-inflammatory and other actions. One of the major causes of sickness and mortality around the world is infection with gram-positive and gram-negative bacteria. Although antibiotics remain the cornerstone of treatment for bacterial infections, the discovery and widespread dissemination of organisms that are resistant to antibiotics have already become a major concern for public healthcare systems. Since the coumarin moiety is found in nature almost everywhere, it has the ability to attach to the B subunit of DNA gyrase in bacteria and prevent DNA supercoiling by inhibiting ATPase function, making coumarin derivatives potentially antibacterial. It is conceivable that hybridizing the coumarin moiety with other antibacterial pharmacophores may present opportunities for the development of novel antibiotics since several coumarin-containing hybrids, such as coumermycin A1, clorobiocin, and novobiocin, have already been used in clinical practice for the treatment of different bacterial infections.

Keywords: *Coumarin, Coumarin derivatives, Antibacterial activity, DNA gyrase, Structure-activity relationship.*

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A Review on Transdermal Drug Delivery System: A Tool for Novel Drug Delivery System

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Abstract: Approximately 74% of medications administered today are taken orally and are not as effective as desired. Transdermal medication delivery systems were developed to enhance such features. A transdermal medication delivery system is a formulation that is applied to the surface of the body and is intended to transmit the active substance via the skin and into the bloodstream. Transdermal drug administration benefits include limiting hepatic first-pass metabolism, improving therapeutic effectiveness, and maintaining a constant plasma level of the drug. Every square centimetre of human skin is known to have between 200 and 250 sweat ducts and 10 to 70 hair follicles on average. It is one of the human body's organs with the easiest access. The skin is a popular drug administration site for both local and systemic effects. To boost bioavailability and the number of medications for which topical and transdermal distribution is an effective alternative, skin penetration augmentation techniques have been developed.

Keywords*: NDDS, Novel drug delivery system, TDDS, Transdermal drug delivery system, Skin.*

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P-10

COVID-19 Pathophysiology: A Review

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Abstract: A new coronavirus that is now known as SARS-CoV-2 caused a number of acute, atypical respiratory illnesses in December 2019 in Wuhan, Hubei Province, China. This virus was responsible for COVID-19, an illness. Human-to-human transmission of the virus has resulted in pandemics all over the world. As a result of the rising death toll and the need for social seclusion and lockdown in numerous nations, the death toll continues to grow. Epidemiological research revealed that older patients were more vulnerable to serious illnesses, although children typically exhibit milder symptoms. We evaluated the state of our understanding of the disease and discussed some hypotheses for why symptoms in children and adults may differ. The multifunctional coronavirus spike protein is a molecular tool that facilitates coronavirus entrance into host cells. It first employs its S1 subunit to connect to a receptor on the surface of the host cell and then uses its S2 subunit to fuse the viral and host membranes. As a result of two domains in S1 from various coronaviruses recognizing various host receptors, the virus attaches to the host. The two physically different conformations of the spike protein are prefusion and post-fusion.

Keywords*: Covid-19, Pathophysiology, SARS-CoV-2, Coronavirus, Respiratory illnesses, Spike protein.*

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P-11

Nutraceuticals: A Review

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Abstract: Nutraceuticals are foods that benefit human health in some way. It includes herbal items, probiotics and prebiotics, medicinal foods intended for illness prevention and treatment, and food supplements. Major nutraceuticals have various therapeutic effects and no side effects, which piques customer interest. The market for nutraceuticals in India is expanding primarily due to a shift towards preventive therapies, rising disposable income, a favourable pricing environment, growth in the pharma retail chain, and rising healthcare spending. However, there are some challenges, including a lack of standardization, high prices, marketing, and distribution. The United States, India, and European nations are experiencing tidal expansion in the nutraceutical business. Through corporate partnership models, efficient regulatory compliance, and analyzing important trends and consumer references, this market can be accessed more quickly.

Keywords*: Nutraceuticals, Human health, Probiotics, Prebiotics, Herbal, Standardization, Therapeutic effects.*

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A Review on Herbal Cosmetics

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Abstract: Herbs have been used by humans for a variety of purposes, including food, medicine, and cosmetics. The Greek term "kosm tikos," which means to be able to organize or decorate, is the source of the English word "cosmetic". As cosmetics advanced throughout the history of mankind, a consistent account of their beginnings emerged. In prehistoric times, around 3000 BC, people used colour to decorate their bodies and to draw the attention of the prey they wanted to hunt. People also used colour to shield themselves from attack by the adversary by decorating their bodies and colouring their skin (whether human or animal). The early history of cosmetics was influenced by superstition, religion, warfare, and hunting. A product that contains one or more herbal substances is labelled as "herbal cosmetics". It is one that has been created utilizing diverse cosmetic ingredients that are legal to use as a base. New opportunities in the cosmeceuticals business have been opened up by the rising demand for natural products. The current desire to appear younger than one's actual age and to be lovely, youthful, endearing, and fair has directly raised the market demand for herbal cosmetics and cosmetic drugs. As a result, the use of herbal cosmetics and cosmeceuticals is ignored in the evaluation.

Keywords*: Cosmeceuticals, Cosmetic formulations, Herbal products, Herbal cosmetics, Skincare products.*

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Validation of Analytical Procedure of UV-VIS Spectrophotometer for the Determination of Cilnidipine

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Abstract: The primary goal of this research work was to develop and validate a simple and sensitive method of UV-VIS spectroscopy for quantitative estimation of cilnidipine as per ICH Q2 (R1) guidelines. The absorption maximum of cilnidipine was 240 nm in a 10% ethanolic 0.1N HCl solution. The R2 value was 0.9964 and linearity was in the concentration range of 2-10 µg/ml. The drug content in the marketed formulation (CILACAR®) was 98.47% which was in the acceptable range according to Indian Pharmacopoeia 2018. The recovery method was used to study the accuracy of the developed method at three different levels (80%, 100%, and 120%). The % recovery was more than 99%. The interday and intraday measurements were used to study the precision. The % relative standard deviation was less than 2 for both accuracy and precision. The limit of detection and limit of quantification was found to be 0.759 µg/ml and 2.300 µg/ml, respectively. The results of validation showed that the analytical procedure of the UV-VIS spectrophotometer was developed for the determination of cilnidipine is reliable, precise, accurate, simple, and cost-effective for routine analysis.

Keywords*: Validation, Cilnidipine, UV-VIS spectrophotometer, ICH Q1 (R1) guidelines, Analysis.*

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Nanoemulsion: An Advanced Mode of Drug Delivery System

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Abstract: The nanoemulsion drug delivery system is an advanced mode of delivering and improving hydrophobic drugs' bioavailability with high first-pass metabolism. Both high and low-energy methods can prepare the nanoemulsion. High-energy processes include high-pressure homogenization, micro fluidization, and ultrasonication, whereas low-energy methods include phase inversion and self-nano emulsification methods. Low energy method should be preferred over high energy method as it requires less energy, so it is more efficient and does not require complex instruments. However, high-energy methods are more favourable for food-grade emulsions as they need low quantities of surfactants than standard energy methods. Techniques for formulating nanoemulsion drug delivery systems overlap, especially in the case of the low-energy process. This review has classified different ways to develop nanoemulsion systems based on energy requirements, phase inversion, and self-emulsification.

Keywords*: Nanoemulsion, Self-nano emulsification, Drug delivery, Nanotechnology, Novel drug delivery systems.*

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Formulation, Evaluation, and Characterization Aspects of Solid Lipid Nanoparticles

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Abstract: Drug delivery technology has a broad spectrum that is continuously being upgraded at a breathtaking speed. The two significant attributes extensively delivered to target sites are different fabricated nanoparticles and drug processing, low solubility, and poor pharmacokinetics profiles. Among the colloidal carriers, nano lipid dispersion (liposomes, deformable liposomes, virosomes, ethosome, and solid lipid nanoparticles (SLNPs)) are ideal delivery systems with the advantages of biodegradation of nontoxicity. Among them, nanostructured lipid carriers and SLNP are dominant and can be modified to exhibit various benefits compared to liposomes and polymeric nanoparticles. Nanostructured lipid carriers and SLNP are non-biotoxic since they are biodegradable. Besides, they are highly stable. Their (nanostructured lipid carriers and SLNPs) morphology, structural characteristics, ingredients used for preparation, techniques for their production, and characterization using various methods. Although nanostructured lipid carriers and SLNPs are based on lipids and surfactants, these two matrices' effect on building excipients is also discussed with their pharmacological significance with novel theragnostic approaches, stability, and storage.

Keywords*: Solid lipid nanoparticles, SLNPs, Nanotechnology, Size reduction, Formulation, Evaluation.*

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Formulation, Evaluation, and Characterization Aspects of Nanocrystals

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Abstract: Nanocrystals are regarded as an essential nanoformulation exhibiting the advantage of increased dissolution and saturation solubility with chemical stability and low toxicity. With the advent of technologies, many drugs have been discovered with better efficiency, but their clinical application is restricted due to poor water solubility. Nearly 40% of the drug in the pipeline and around 60% of compounds coming directly from synthesis have poor solubility. Poor solubility is generally associated with poor bioavailability. Nanocrystals have the potential to overcome the issue. The change of material into a nano dimension dramatically changes its physical properties. Drug nanocrystals are crystals with a size in the nanometer range of <1000 nm. These are produced using various technologies like top-down, bottom-down, high-pressure homogenizers, and combinative technologies for nanocrystals. Most importantly, this poster outlines the pharmaceutical applications, including their formulation, administration methods, safety, and toxicity. The commercial status, limitations, challenges, and future trends of nanocrystals for pharmaceutical applications are also included.

Keywords*: Nanocrystals, Nanotechnology, Formulation, Evaluation, HPH, Nanosized, Size reduction.*

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Nanosuspension: An Approach to Enhance Solubility of Drugs

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Abstract: One of the major problems associated with poorly soluble drugs is very low bioavailability. The problem is even more complex for drugs like itraconazole, simvastatin, and carbamazepine which are poorly soluble in both aqueous and nonaqueous media, belonging to BCS class II as classified by the biopharmaceutical classification system. A formulation such as nanosuspension is an attractive and promising alternative to solve these problems. Nanosuspension consists of a pure poorly water-soluble drug without any matrix material suspended in dispersion. Preparation of nanosuspension is simple and applicable to all drugs which are water-insoluble. A nanosuspension not only solves the problems of poor solubility and bioavailability but also alters the pharmacokinetics of the drug and thus improves drug safety and efficacy. This review article describes the preparation methods, characterization, and applications of nanosuspension.

Keywords*: Bioavailability, Colloidal dispersion, Drug delivery, Nanosuspension, Solubility, Nanotechnology.*

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A Review on Novel Antifibrotic Drug – Pirfenidone

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Abstract: The respiratory issue of idiopathic pulmonary fibrosis is proven to be a fatal condition. There are currently few medications that can effectively treat this lung infection. However, anti-fibrotic medications like nintedanib and pirfenidone have been licensed to treat IPF. Imaging tests including X-rays, CT scans, and echocardiograms as well as lung function tests like pulmonary function testing and pulse oximetry, exercise tests, and arterial blood gas tests can be used to diagnose this illness. Pirfenidone has proven antifibrotic and anti-inflammatory properties in a variety of in vitro systems and animal models of fibrosis. Pirfenidone belongs to the class of medications known as pyridones. High-performance liquid chromatography is used to quantify pirfenidone. This molecule served as a pharmacological instrument for investigations defining the mode of action of pirfenidone in the future. Future studies are necessary to demonstrate pirfenidone's beneficial effect in patients with heart failure and preserved ejection fraction.

Keywords*: Idiopathic pulmonary fibrosis, Pirfenidone, Pyridine derivatives, Fibrosis, HPLC, Lung infection.*

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New Techniques for the Administration of Drugs to Treat Wounds

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Abstract: The ultimate objective of wound healing research is to completely regenerate and restore the structure and function of the skin with no or minimum scarring. Novel pharmacological carriers may be used to transport wound-healing medications such as antibiotics, antimicrobials, human EGFs, and others; thereby providing a possible platform to get beyond the drawbacks of traditional wound dressings. This Abstract will discuss a number of methods, including microspheres, nanoparticles, liposomes, solid lipid nanoparticles, nano- and microemulsions, sponges, wafers, etc., that are effectively used as carriers for wound-healing medications. There is additional discussion of the findings of several investigations, including *in vitro* and *in vivo* tests.

Keywords*: Bioavailability, Colloidal dispersion, Drug delivery, Nanosuspension, Solubility, Nanotechnology.*

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Salacia Species: An Unexploited Opportunity to Treat Diabetes and Obesity

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Abstract: Around 50% of diabetic people worldwide consume complementary medicines in addition to or as a treatment for their diabetes. *Salacia reticulata* (family Hypocrataceae), is an indigenous woody climber flowering plant, frequently used in the Ayurvedic medical system to treat diabetes and obesity. It is also known as kothala himbutu and grows in the dry zone forest of India and Sri Lanka. It is reported to possess anti-oxidant, anti-hyperlipidemic, anti-hypertrophic, anti-fibrogenic and hepatoprotective activity. We critically analyze the available *in-vitro*, animal and clinical research supporting the use of *Salacia reticulata* for the treatment of type 2 diabetes and obesity. Constituents that have been identified as exhibiting anti-diabetic effect includes salacinol, kotalanol, ponkorinol and salaprinol. Various *in-vitro* research depicted the ability of Salacia to inhibit intestinal alpha-glucosidase. In addition, it increases lipolysis and reduces insulin resistance by enhancing the mRNA expression for hormone-sensitive lipase (HSL) and adiponectin respectively in the mouse mesenteric fat. *Salacia reticulata* treatment up-regulates the lipolysis factors with downregulating the 3T3-L1 adipocytes lipogenesis factors. Both animal studies and clinical research consistently showed significant improvement in glucose concentrations in the fasted vs sucrose and maltose-loaded states. Furthermore, 6 weeks to 3 months of treatment showed a substantial reduction in the HbA1C and plasma Insulin. *Salacia reticulata* efficiently decreases obesity and insulin resistance while enhancing glucose metabolism therefore a larger evidence base from well-planned research is required to establish its efficacy and safety. Moreover, the elicitation study to improve callus biomass, polyphenolic content, biosynthesis of mangiferin and biological potential of the *Salacia* genus demonstrated that it might be a perfect source for the large-scale production of industrially important secondary metabolites. At the same time, data indicate cumulative knowledge highlighting its strong antioxidant effect and exposing its potential without affecting natural resources.

Keywords*: Salacia reticulata, Kothala himbutu Diabetes, Obesity, Anti-oxidant, Hormone-sensitive lipase.*

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Spectrophotometric Determination of Chloramphenicol and its Degradation Product in Ophthalmic Formulation

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Abstract: A simple, rapid and sensitive UV spectrophotometric method has been developed for the simultaneous quantification of chloramphenicol and its degradation product (2-amino-1-(4-nitrophenyl)propane-1,3-diol, AMPD) in a mixture. Chloramphenicol degrades easily to AMPD in an ophthalmic formulation when exposed to sunlight. The simultaneous equation method was developed through the spiking method. For chloramphenicol and AMPD, the absorbance was measured at 237 and 253 nm respectively. The method was discovered to be linear, sensitive, rapid and accurate. ICH guidelines were followed in developing the procedure.

Keywords*: Chloramphenicol, AMPD, 2-Amino-1-(4-nitrophenyl)propane-1,3-diol, Spiking method, UV spectrophotometric method.*

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Need of Integration and Role of AYUSH Therapies in Modern Medicine: A Review Study of the Awareness of Physicians Towards the Utilization of Combination System of Medicine for Hormonal Imbalance

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Abstract: Hormone-like substances including thyroxin, oestrogen, and testosterone are produced by glands in the endocrine system. Through systemic circulation, hormones direct organs and tissues on when to do and what to do it. A hormonal imbalance exists if a hormone is produced either excessively or inadequately in circulation. Endocrine problems, which affect 5% of women and 4% of men, are the fifth ailment on this list of global diseases. Due to the vital function that hormones play in the organism; even little hormonal abnormalities can have an effect on the whole body. Combination therapy, often known as polytherapy, is a type of treatment that makes use of many medications or pharmacological systems. Usually, the word refers to using a mix of active ingredients to treat a specific condition. Most doctors have some familiarity with the treatment approaches of homoeopathy and Ayurveda combined with allopathy. Yet when it comes to merging them, they are not very practised. The majority of individuals have different. Lack of scientific evidence is frequently the biggest barrier stopping AYUSH remedies from becoming widely used. According to this evaluation, further research is needed to determine the efficacy and safety of AYUSH treatments in order to allow clinicians to give patient care. The issues and possibilities for the best possible care for this lifestyle condition are all brought together in this review study.

Keywords*: AYUSH remedies, Hormones, Integrative, Treatment, Polytherapy, Modern medicines, Ayurveda.*

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Nano Formulation Approaches of Sesamol for Cancer: An Updated Review

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Abstract: Sesamol, a natural phenolic compound, is one of the primary lignans that can be isolated from the seeds of Sesamum indicum and from sesame oil. Both the nutritional and health-promoting qualities of sesame oil have garnered a lot of attention throughout the years. In recent years, sesamol has gained recognition for being an effective adjuvant therapeutic medication in the fight against cancer. The apoptotic nature of sesamol was demonstrated by the fact that it inhibited cell proliferation. The aim of this review is to highlight the current aspect of sesamol-loaded nanoformulation, targeting cancer. Using a number of different search engines, a search of the published literature was conducted, and several investigations have shown that sesamol has substantial antioxidant and anticancer effects. Several studies have indicated that sesamol may be widely used for the treatment of various carcinomas. It has only been observed to trigger apoptosis in cancer cells such as liver cancer cells, breast cancer cells, skin cancer cells, and human colon cancer cells. The current research investigates previously published data on the application of sesamol nanoformulations in cancer therapy, making use of a wide variety of nano-delivery systems. This research highlights the potential of sesamol as a novel medicinal agent for the treatment of a wide variety of cancers. Nanotechnology's lipid-based and polymer-based nanoformulation have shown promise for treating cancer, and delivering sesamol via this method makes cancer care substantially more manageable.

Keywords*: Sesamol, Phenolic compounds, Cancer, Anticancer, Lignans, Sesamum indicum, Nanoformulation.*

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Nanoemulsion Approach to Negotiate Parochial Barriers for Pulmonary Drug Delivery using Factorial Design

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Abstract: Chronic airway infection and inflammation are the most significant source of morbidity and mortality in cystic fibrosis patients. Inflammatory lung diseases related to morbidity and mortality impose a substantial financial burden. Inflammation is a hallmark of many respiratory system diseases, directly or indirectly linked to adverse health conditions, air pollution, rapid lifestyle changes, and regular outbreaks of microbial infections. The unique anatomical and physiological features of the lungs make them an ideal target organ in treating inflammatory respiratory disease. With the help of inhaled therapy, the lungs can be targeted directly. The principal objective of this research is to present the comprehensive role of nanoemulsion in treating and managing inflammatory respiratory diseases. Nanoemulsions have garnered considerable attention in research and therapeutics due to their advantages like thermodynamic stability, optical clarity, ease of preparation, and unique property of behaving as a super solvent for solubilizing hydrophobic and hydrophilic solutes. Due to the above attributes, nanoemulsions find numerous applications in diagnosing and treating diseases. Ivacaftor nanoemulsion in the current study was prepared using transcutol as a cosurfactant, Tween 20 as a surfactant, and capmul as oil, which was selected after solubility analysis of the drug in the individual excipients. The preliminary formulation exhibited 97.54±0.19 % of drug content with 95.76±0.42% of transmittance. The optimized batch showed a zeta potential of -15 mv with a globule size of 97.65 nm. Physiochemical parameters were measured for viscosity, pH, dilution, and dye solubility. Prepared nanoemulsion capsules were stable, and all the formulations were found within acceptable limits of physical characteristics.

Keywords*: Factorial design, CFTR, Nanotechnology, High-speed homogenization, Solubility enhancement.*

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Synthesis and Characterization of Pharmaceutical Co-Crystals of Glibenclamide

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Abstract: Co-crystallization is one of the best techniques to enhance the solubility of poorly water-soluble drugs. Co-crystals are solid crystalline substances consisting of the drug and co-former in a fixed ratio via non-covalent interactions. Glibenclamide was selected as a model drug because of its poor solubility. Among various methods, the pK_a method was used for the selection of co-formers to prepare co-crystals. Using pK_a method, caffeic acid was selected as a co-former. After co-former selection, the co-crystals of glibenclamide were prepared with the selected co-former (caffeic acid) with an equimolar ratio of 1:1 by the solvent evaporation method. Further characterization was performed using differential scanning calorimetry (DSC). The reduction of melting point in the DSC analysis indicated the formation of co-crystals.

Keywords*: Co-crystallization, Co-crystals, Glibenclamide, Water solubility, Caffeic acid, Solubility.*

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Assessment of Nutritional Status of Adolescent Girls in Roorkee, Uttarakhand

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Abstract: Malnutrition is largely a result of the world's nutritional deficiencies. Because of the low socio-economic status and lack of nutritional education and unavailability of healthcare, the prevalence of malnutrition is highly prevalent in developing countries. The adolescent period comes across increased physical exercise and fast growth and development, therefore they require to develop supplementary nutritional habits for decreasing the risk of nutritional deficiencies. The objective of this study will be to find out the frequentness of overweight, underweight and other nutritional deficiencies in adolescent girls. The main aim of the study will focus on using nutrition therapy to reduce low nutritional status among adolescent girls who are suffering from overweight underweight and other micronutrient deficiencies. A community-based cross-sectional analysis was conducted from June to July 2022 in Roorkee. 125 adolescent females were interrogated using pre-design, pre-tested a set of questions and anthropometric measurement was done supported by a standardized tool. Microsoft Excel and the statistical application SPSS version 21 were employed to evaluate the findings. Adolescent females were categorized according to their anthropometric parameters and the WHO nutritional assessment criteria. Girls were moderately stunted in percentage 45.50% and severely thin in percentage 5.39%. In addition to being thin, 30.25% and overweight 10.21%, anaemia symptoms 32.25%, dental caries 2.80%, and vitamin A insufficiency 2.46% were also present. The current study reveals very poor nutritional status among adolescent females in Roorkee. Lack of nutritional education of mothers is the key factor in developing nutritional deficiencies in this age group. Nutritional awareness and nutritional interventions to diminish the prevalence of nutritional deficiencies and anaemia in this vulnerable group are the need of the moment.

Keywords*: Nutritional status, Underweight, Overweight, Nutrient deficiencies, Adolescent girls.*

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Nanoparticles of Mesalamine Loaded Silk Fibroin: Preparation and Characterization

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Abstract: Mesalamine or 5-aminosalicylic acid has been used for several years in the treatment of inflammatory bowel disease. Oral administration of the drug produces a complete systemic absorption from the small intestine. Currently available oral dosage forms are designed to avoid this proximal absorption problem from the GI tract and are targeted to deliver the drug at the site of infection in the distal part of the intestine. When administered orally, mesalamine gets metabolized by acetylation reaction in the liver leading to lesser drug reaching the targeted site and hence lower therapeutic effect. In the context of the above principle, a strong need was recognized for the development of a controlled and targeted-release drug delivery system for the drug. An approach known to fulfil both the needs is Silk Fibroin Nanoparticles approach. This is useful in delivering the drug in the unchanged form at the targeted site, i.e., the small intestine. The aim of the study was the preparation and characterization of mesalamine-loaded silk fibroin (SF) nanoparticles. The method used for the preparation of SF Nanoparticles was the phase separation method. The prepared formulation will be characterized for several parameters such as weight variation, SEM, disintegration time, drug content, in-vitro drug release and stability studies. The results indicated optimum formulation within IP specifications. The results depicted controlled release which followed first-order kinetics. The synthesized Nanoparticles approach was proposed to be beneficial and suggested for targeted delivery of the drug at the site of infection.

Keywords*: Silk fibroin, Nanoparticles, Phase separation method, Mesalamine, Controlled release, Targeted release.*

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Role of Drug Discovery and Development for Hydrogel Formulation

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Abstract: Hydrogels are three-dimensional cross-linked hydrophilic polymers that swell in water and aqueous solutions without dissolving in them. Softness, smartness, and the capacity to store water make hydrogels unique materials Several techniques have been reported for the synthesis of hydrogels like co-polymerization of co-monomers using multi-functional co-monomer, which acts as a cross-linking agent. They can be classified in different ways on the basis of their preparation, biodegradable properties, polymer, sensitivity to the surrounding environment and also their application. Hydrogels being biocompatible materials have been recognized to function as drug protectors, especially for peptides and proteins, from an in-vivo environment. Physical hydrogels are formed through weak secondary forces and chemical hydrogels are formed by covalent forces. Various polymers of natural and synthetic origin are used to make hydrogels. Swelling, mechanical properties and biological properties are among the most important properties of hydrogels, each of which can affect the structure and morphology of the hydrogel. Hydrogels that are responsive to specific molecules, such as glucose or antigens, can be used as biosensors as well as drug delivery systems. Hydrogels now have attracted growing interest from most scientists in various research fields. Hydrogels have played a significant role in a wide range of applications including drug delivery systems, diagnostics, tissue engineering, optics and imaging. Today, there are many issues affecting drug delivery and hydrogel may be one possible solution to those. Due to its structure similar to the extracellular matrix and its ability to absorb water, hydrogen is used in various medical applications such as tissue engineering, contact lenses, wound dressings, and the release of therapeutic agents.

Keywords*: Hydrogels, Cross-linking agents, Irradiation, Interpenetrating network, Complex coacervation.*

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Magnitude of Herbal Formulations in the Treatment of Rheumatoid Arthritis

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Abstract: Rheumatoid arthritis is a chronic inflammatory systemic autoimmune disease that influences the joints with different intensities among patients. The risk factors incorporate age, gender, genetics, and environmental exposure (cigarette smoking, air pollutants, and occupational. The utilization of herbal formulation is the rich or prime source of highly dominant traditional drugs for the treatment of arthritis. Unluckily, there is still no dominant known medicinal treatment that heals rheumatoid arthritis. The aim of this study was to study the market utility of different herbal formulations used in the management of rheumatoid arthritis. This study is based on data collected through a face-to-face survey of different medical shops. After surveying medical stores, we know which herbal formulations are used in rheumatoid arthritis. Yograj, Rumalaya, Ortho tablet, Joint health, Arthofect, Rhuma oil, Orthoveda, Rhumatil oil, Dr. Rumacare Gold, Joint fit plus, rhumex, artho active, Artho-well, etc., are used in rheumatoid arthritis. These herbal formulations are used to reduce swelling and for instant pain relief to benefit pain conditions such as back pain, knee pain, joint pain, muscle pain, stiffness, etc. Survey data demonstrated that the most demanding herbal formulation is Rumalaya and the least demanding herbal formulations are Artho-well and Arthozena oil.

Keywords*: Rheumatoid vasculitis, Arthritis, Chronic, Autoimmune diseases, Herbal formulations.*

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Nanostructured Lipid Carrier: A Novel Drug Delivery for the Management of Pancreatic Cancer

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Abstract: Targeted drug delivery-based lipid nanoparticles have emerged as a new and effective approach in Pancreatic cancer chemotherapy. Here, we investigated at how drug-modified nanostructured lipid carriers (NLCs) may improve the effectiveness of 5-fluorouracil in pancreatic cancer cells. 5-Fluorouracil NLCs were prepared using a high-pressure homogenization method. In this method, Compritol 888 ATO (solid lipid) and oleic acid (liquid lipid) were used in different concentrations. Poloxamer 188 and Tween 80 was also used as a surfactant, which was selected after solubility analysis of the drug in the individual excipients. The preformulation study of 5-fluorouracil included FTIR study, melting point, standard calibration curves, and drug-polymer interaction study. The preliminary formulation exhibited 96.32±0.15% of drug content. The optimized batch showed a zeta potential of -1.88 mv. The Optimum size of nanoparticles was obtained in a mean average of 15.1±2 nm with a polydispersity index (PDI) of 0.339. The NLCs formulation was 89% released within 6 hours in a controlled manner. NLCs modify drug release, improve bioavailability, and reduce 5-fluorouracil side effects. If the ligand can be attached, the resulting formulation is the most effective formulation for treating pancreatic cancer. The results of the study have shown that the formulation of NLCs may effectively prevent the unwanted cytotoxicity of healthy cells.

Keywords*: Nanotechnology, Nanostructured lipid carriers, Targeted drug Delivery, High-speed homogenization, Chemotherapy.*

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Impact of Artificial Intelligence on the Pharmaceutical Sector

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Abstract: Artificial intelligence is one of the top technologies for the digital revolution and is advancing more quickly than ever. To improve data processing, artificial intelligence can be used in almost every element of the pharmaceutical and healthcare sector. Adopting artificial intelligence technology will highlight the healthcare industry's amazing potential, with success rates soaring higher than ever before, particularly in the study and production of vital, game-changing pharmaceuticals. In this work we have discussed how artificial intelligence can transform the pharma industry, the uses of artificial intelligence in drug development, drug manufacturing improvement, and the marketing of drugs. We also tried to present some ideas that how we can introduce artificial intelligence in Ayurveda to modernize the system. To overcome problems in Ayurvedic pharmaceutics, artificial intelligence can be utilized for incorporating engineering ideas into medicine development. This can be accomplished by integrating artificial intelligence with the various pharmaceutics branches of Ayurveda. In this investigation, an effort has been made to assess problems and potential fixes for Ayurveda's global adoption using artificial intelligence (AI) as well as the pharmaceutical industry.

Keywords*: Artificial intelligence (AI), Pharmaceuticals, Pharmaceuticals industry, Ayurveda, Global adoption.*

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An Overview of Applications of Ferrocene and Its Derivatives in Biology, Medicine and Environment

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Abstract: Ferrocene derivatives have so many applications in the biology field. These are useful for the detection of cancer in patients through the electrochemical process in which DNA electrodes are prepared. The DNA biosensor has many incredible applications in biomedicine, biochemistry, and forensics for cancer determination, and synthesis of drugs such as antitumor agents, anti-malarials, anticonvulsants, and many more. The ferrocene-based nanocapsules have wide applications in drug delivery, manufacturing of cosmetics, biotechnology, and biomedicine. The ferrocene-based biosensors are also useful in the health care field and biology for the detection of the level of glucose in the human body. The ferrocene biosensors are also helpful to detect pollutants in the environment. The paste of ferrocene is applied to the carbon nanotubes and do some modifications to prepare the voltammetric sensors. These voltammetric sensors are used for the detection of sulfide ions that are mixed in the environment through the use of fertilizers and pesticides during agriculture practices. The aim of this review article is to present the tremendous applications of ferrocene derivatives in the medicinal, biology, and environmental fields. Ferrocene-based biosensors are used for the detection of cancer, drug delivery, manufacturing of cosmetics, and synthesis of medicines. It is also used to detect the sulfide particles present in the environment. Along with that, it is used in the healthcare sector to check the level of glucose in the human body.

Keywords*: Ferrocene, Biosensors, Nanocapsules, Voltammetric sensors, Biochemistry, DNA Drug.*

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A tremendous review on plant- Mulberry (Morus spp.)

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Abstract: The hardy perennial woody plant known as the mulberry (Morus spp.) belongs to the genus Morus of the family Moraceae. Its leaves have long been used in traditional medicine for a variety of illnesses. Bombyx mori, the silkworm used to make silk, commonly eats mulberries, making its cultivation very cost-effective. The mulberry fruit is a valuable food source for making a variety of value-added products, such as jams, jellies, wines, squash, pastries, chocolates, yoghurt, probiotics, syrup, and vinegar, which helps industrialists make better use of the plant's fruits, leaves, and other parts. Mulberries are also rich in carbohydrates, protein, and dietary fibre. They include many potent chemical substances, including vitamin C, phenolic acids, and flavonols like rutin, isoquercitrin, and kaempferol, as well as polyphenol antioxidants. In addition to being a potential food source, mulberries also have unique therapeutic properties. These include anti-oxidant, anti-diabetic, anti-hypertensive, anti-cancer, hepatoprotective, anti-obesity effect, anti-atherosclerosis, prevents hyperpigmentation and naturally lightens skin tone. The chemical composition, biological characteristics, and therapeutic effectiveness of mulberry leaves are compiled and summarized in the current review.

Keywords*: Mulberry, Food stuff, Morus spp., Pharmacological benefits, Nutritional value, Flavonols.*

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Monograph Profiling of Clove Oil Extracted by Using Clevenger Apparatus: Creating an Opportunity for Industrial Data Base System of Herbal Drugs

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Abstract: Herbal monograph is a compilation of experimental data on herbal ingredients or bioactive compounds having selected parameters. The aim of the present work was to extract the oil from the clove and prepare its monograph profile. Oil was extracted from clove buds (*Eugenia caryophyllus*) and extraction was performed using hydro distillation (Clevenger apparatus) which is the most common extraction technique. The selected parameters such as colour, odour, solubility, foreign matter, density, viscosity and TLC were performed in clove oil. The fingerprinting profile was done by thin layer chromatography (TLC) using the mobile phase at the ratio of n-hexane: ethyl acetate: acetic acid (7:2.5:1). The fingerprinting of clove oil was recorded and suggested various chemical constituents present in the total extracted oil. In conclusion, this monograph could contribute to the identification and quality control of clove oil. Besides, it can create an opportunity for an industrial database system of herbal drugs.

Keywords*: Clove oil, Eugenia caryophyllus, Herbal drug, Clevenger apparatus, Extraction, Monograph.*

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Magic: Herbal Painkiller Ointment

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Abstract: Pain is normally treated with oral non-steroidal anti-inflammatory agents and opioids. These drugs are to be taken very carefully. It is much safer to use topical preparations made from plants to treat pain. The ointment must contain compounds that penetrate the skin, and inhibit receptors of pain to relieve pain. The use of ointment pain relievers has the potential to save many lives, decrease medical costs and improve therapy. Pain killers comprise amount of mixture such as peppermint oil, arnica extract, glycyrrhizin, and distilled water. Capsaicin helps block pain messages to your nerves, capsaicin and cream relieve pain such as: joint conditions like rheumatoid arthritis and osteoarthritis, muscle sprains, and strains, migraines and other severe headaches. Ingredients such as olive oil, coconut oil, lavender, etc., are widely used for pain treatment such as non-steroidal anti-inflammatory drugs. Patients/public that oral treatments can potentially lead to more adverse effects as compared: to NSAIDs are popular drugs and have widespread use in chronic and acute musculoskeletal conditions. The goal of topical NAIDS is to minimize systematic adverse effects and encourage compliance Topical NAIDS are presented as gel, cram a spray to penetrate through the skin. Diclofenac has antipyretic and auth=" Inflammatory actions approved for the treatment of rheumatoid arthritis. The formulation of diclofenac gel is available for the management of pain & stiffness in osteoarthritis of the cannabinoids treat for analgesia.

Keywords*: Non-steroidal anti-inflammatory agents, Musculoskeletal, Rheumatoid arthritis, Herbal ointment.*

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Formulation and Packaging of Herbal Face Pack Powder

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Abstract: Everybody wants to get fair and charming skin. Now a day, ache, black head, pimples, and dark circles are common among youngsters and person who suffers from it. Skin problems are due to impurities in the blood. Various herbs are described in Ayurveda for blood purification. The herbal paste is applied or faces to treat acne, pimple, scars, mares and pigment. Herbal formulations are going in demand in the world market. The objective of this work is to formulate and evaluate a cosmetic preparation face pack from herbal ingredients. Sandalwood, rose petal powder, turmeric powder, and Fuller's earth were procured from the local market in the saw form and grind with mortar and pestle, fine powder will be prepared and then passed through sieve No. 80 and mixed thoroughly with raw milk & rose water. It nourishes the skin. Fruit face pack supply essential nutrients to the skin, remove dead cells of the skin and help to prevent premature ageing of the skin. Ingredients such as Fuller's earth help the skin by removing blackheads and cleaning the skin. Turmeric possesses anti-inflammatory properties and it is the best source of blood purifiers. Sandalwood is having anti-tanning and anti-ageing properties. Orange peel is a source of vitamin C and the odour of the prepared formulation was good and acceptable which is desirable for cosmetic formulations. It is suggested that the prepared formulation was physio-chemically and microbiologically stable.

Keywords*: Face powder, Fuller's earth, Anti-inflammatory, Powder, Cosmeceuticals, Skin tone.*

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Formulation and Evaluation of Microspheres of SGLT2 Inhibitor

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Abstract: Canagliflozin is the first oral agent in a novel class of diabetes drugs as an inhibitor of sodium-dependent glucose co-transporter 2 (SGLT2). SGLT2 is a large class of proteins that facilitate the transport of sugars and sodium across the plasma membrane of cells from an extensive variety of tissues. SGLT2 is a high-capacity and low-affinity transporter, responsible for nearly 90% of active renal glucose reabsorption. SGLT2 is exclusively expressed in renal proximal tubules, its inhibition is therefore unlikely to affect other organs. Thus, inhibition of SGLT2 limits renal glucose reabsorption, promoting its urinary excretion and the reduction of plasma glucose levels. Thereby, SGLT2 inhibitors use a novel mechanism of action, since they do not interfere with insulin secretion. The main objective of the work is to prepare canagliflozin-loaded microspheres using natural and semi-synthetic polymers like chitosan, sodium alginate and ethyl cellulose. Natural polymers have anti-microbial properties so could minimize the major side effect of drugs like urinary tract infections. Formulations were prepared by the solvent evaporation method, ionotropic gelation method and spray drying methods with the implementation of full factorial design. The microspheres were evaluated on various parameters with drug polymer compatibility (DSC and IR studies), in-vitro drug release, kinetic models, 3-D plots and Contour plots. The percentage of drug release is 94% for a period of 15 hours. The result showed that as the concentration of polymer increases it affects the particle size, percentage yield, and in vitro drug release of microspheres. The prepared microspheres would minimize urinary tract infection in diabetic patients who intake canagliflozin. In patients with type 2 diabetes, SGLT2 inhibitor will reduce the risk of the first hospitalization for heart failure, possibly through glucose-independent mechanisms.

Keywords*: Canagliflozin, Ethylcellulose, Chitosan, Sodium alginate, Factorial design, SGLT2 inhibitor, Microspheres.*

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Biotechnology in Drug Discovery and Development

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Abstract: Biotechnology is used for the development of biopharmaceutical products by the use of living organisms. Biotechnology involves gene screening, and protein and peptide screening for their therapeutic potential. The other bioformulations that are currently present in the market are antibodies, enzymes, proteins vaccines and other products for diagnosis purposes. The main challenge in biopharmaceuticals is to deliver drugs that fit the individual patient's biology and path physiology. For this, personalized medicines are prepared by studying the genetic makeup of the patients. There are other challenges in drug discovery that are making target identification, cheaper drugs. By decreasing the cost of gene editing and sequencing make them more routinely applied in clinical practice. To overcome these challenges the opinion of professionals and other policymakers, and qualified personnel are required, and also to expand the market of biopharmaceuticals. Biotechnology plays an important role in improving global health day by day.

Keywords*: Biotechnology, Biopharmaceuticals, Bioformulations, Personalized medicines, Gene, Protein.*

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Artificial Intelligence: A New Era in Drug Discovery

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Abstract: A computer simulation of human intelligence is known as artificial intelligence (AI). Getting information, creating rules for using it, drawing conclusions that are plausible or accurate, and self-correcting are all parts of the process. When fundamental scientists learn about biological targets, the development of new drug residues begins (receptor, enzyme, protein, and gene). These targets touch on the biological functions that take place in diseased patients. Target identification, target validation, lead identification, and lead efficacy can all be used to find new drugs. Through data from genetics, proteomics, and other life sciences that advance the process of discovery and development, AI can provide revolutionary insights into medicine. Recently, the medical care sector has developed artificial intelligence (AI) as a fiery element. The biopharmaceutical industry has a lot of exciting potential for growth. The biopharmaceutical industry works to implement AI in drug discovery, research and development, early drug discovery, and support for predicting potential risks/side effects in late trials that can be very helpful in avoiding traumatic events in clinical trials and ultimately clinical trials. Drug development typically takes five years before a trial, but the AI drug only needs one year. The recent explosion of AI-based startups dedicated to drug innovation has been greatly aided by the quick development of life sciences and machine learning algorithms.

Keywords*: Drug discovery, Artificial intelligence, Machine learning, Biopharmaceutical, Clinical phase.*

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Preclinical Drug Development

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Abstract: Preclinical development consists of various activities to support investigational new drugs (IND). Drug discovery & development to frame the research report in a way that places their finding within the drug discovery and development data from pivotal safety, pharmacology & toxicology studies is a critical component of the IND application. One overall theme of our article is that the process is sufficiently long complex and expensive so the many biological targets, must be considered for a new medication approved for clinical use and new research tools may be needed to investigate a new target. These are from safety pharmacology and toxicology studies. It covers pharmacokinetics and metabolism studies and toxicokinetic and tissue distribution studies. It provides information on the absorption, metabolism, distribution and excretion of drug in animal species. It required to include in the IND application. It helps to determine the dose level & frequency of administration for safety pharmacology and toxicology studies in interpretation of the findings from these studies. Safety pharmacology studies include essential, follow-up, & safety pharmacology studies. Toxicology studies are done in animal species are ensuring the safety of compound for human administration. The adverse effect level determined in the chronic toxicity studies gives critical information for calculating of first in human dose. These from systemic toxicology studies, data from many other toxicology studies is required to include in IND. It includes reproductive toxicity, local toxicity, mutagenicity and carcinogenicity studies. The requirement of safety pharmacology and toxicology data depends on the phase of clinical development and not all preclinical studies are required to be completed to initiation of human trials.

Keywords*: Preclinical development, Toxicology, ADME, Single dose, Local toxicity, Mutagenicity, Genotoxicity.*

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Nanocarriers in Ocular Delivery: A Review

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Abstract: Globally, a fungal infection associated with eye annually affects more than one million people. It can lead to impaired vision and sometimes complete blindness. Drug delivery via ocular route has always been a challenge, as in the eye numerous barriers in the cornea, conjunctiva, iris-ciliary body and retina are located which prevents the dose from reaching the site resulting into low bioavailability of drugs. Treatment through conventional dosage form often possess disadvantage of low retention time of drug as they are drained away from pre-corneal cavity by tear flow and lacrimo-nasal drainage. To overcome the above challenge, the need of the hour is to fabricate an ideal delivery system which could overcome the barrier properties of eye as well as results into enhanced drug absorption at the site of action. Till date numerous novel technologies viz. nanoparticles, nanostructured lipid carriers (NLCs), nano micelles, microneedles, liposomes, etc., have been developed. These technologies can overcome the barrier located in the eye, and to improve bioavailability of drugs. NLCs have great potential in ophthalmic use and have become more popular due to its permeability in the eye cavity. The present review aimed to study NLCs as nanocarriers to improve the solubility, permeability, and bioavailability and retention time of drug through ocular administration. High-pressure homogenization, emulsification-solvent evaporation and micro-emulsion are some of the methods by which they can be prepared. NLCs represents a potential nanocarrier for safe delivery of drug to the ocular surface with increased solubility, bioavailability and residence time.

Keywords: *Fungal infection, Ocular delivery, Bioavailability, Nanotechnology, NLCs, Nanocarriers.*

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Standardization and Development of HPTLC Method from Skin Cream Formulation

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Abstract: There is an increasing demand for herbal medicine in the global market and they are invaluable gifts of mother nature. *Curcuma longa* also known as turmeric has diverse pharmacological properties such as anti-inflammatory and antioxidant effects which can benefit skin rashes and wound healing. The motive of the current research work was once to formulate and evaluate the Ayurvedic skin cream of a crude drug comprising extracts of *Curcuma longa*. The organized Ayurvedic skin cream was once evaluated with exclusive parameters such as appearance, spreadability; pH, viscosity, and irritancy test. Further, an HPTLC approach was once developed for the identification of turmeric cream with the usage of chloroform: methanol (7:3) as the cell segment and fingerprinting used to be performed and RF value used to be recorded. The Ayurvedic skin cream used to be an O/W kind emulsion, for this reason, can be without problems washed with water and may additionally provide offers higher results. The present study recommended future herbal cream formulations that can be used for cosmetic purposes.

Keywords*: Curcuma longa, Ayurvedic product, Turmeric, HPTLC, Skin cream, Cosmetic purpose.*

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The Methanolic Extract of Albizia odoratissima (AO) Bark Attenuated the Development of Diabetic Nephropathy in Rats

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Abstract: Healthy Wistar rats of either sex weighing 180-200 g were employed in the present study. Experimental diabetes was induced in rats by injecting streptozotocin at a dose of 45 mg/kg (i.p.). Assessment of diabetic nephropathy (DN) was done by estimating glucose levels in blood and urine samples. Moreover, different antioxidant parameters like catalase, superoxide dismutase (SOD) and thiobarbituric acid reactive substances (TBARS) in kidney tissue samples were assessed. Additionally, inflammatory cytokines like interleukin-1 (IL-1), transforming growth factor beta (TGF-β) and tumour necrosis factor-alpha (TNF-α) were assessed in renal tissue. Methanolic extract of *Albizia odoratissima* bark (AOB) has shown significant prevention against diabetes-associated nephropathy. The bark extract decreased glucose levels both in urine and blood samples. The AOB extract either alone or in combination with a standard drug (glibenclamide) showed a significant reduction in oxidative stress in renal tissue, as demonstrated by increased catalase and SOD levels, or decreased TBARS levels compared to diabetic rats. Additionally, methanolic extract of AOB alone or in combination with glibenclamide significantly reduced inflammatory cytokines like IL-1, TGF-β and TNF-α in diabetic rats. Our studies suggest that the methanolic extract of AOB might be beneficial for the treatment of DN. The ability of AO to attenuate DN may be mediated by the inhibition of oxidative stress and inflammatory cytokines by the AOB extract.

Keywords*: Albizia odoratissima, Nephropathy, Diabetic nephropathy, Streptozotocin (STZ), Glibenclamide.*

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Fixed Drug Eruption: Pathogenesis and Diagnostic Tests

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Abstract: Abnormal procedures for medicines are common and often emerge as a dermal explosion. Fixed drug eruption (FDE) is an adverse reaction of the same type, which refers to the process of recurrence of the body by taking a criminal drug. It is a type of adverse drug reaction (ADR) in which the oval shape lesions are formed on the body of the patient, which is at the beginning. It is light pink and after a long time, it emerges as dark brown hyperpigmentation. Many drugs are such that due to which the fixed drug may be explosive, the patient should be aware of the culprit. Intraepidermal CD8+ T cells have an important role in a fixed drug eruption. Intermediate CD8+ T cells resident in FDE lesions clearly have a significant contribution to the development of a tissue. During the FDE, resting the lesion for a long time, CD8+ T cells have an important role. T cells are mainly composed of a homogenous population, of which TCR-AB expresses CD3, CD8, CD45RA and CD11b, but these T cells do not convey CD27 & CD56. Such accumulation with phenotype in cells has been found in pathogenic sites repeatedly, for example, lungs, suggesting that T cells can act as protective immunity. Intraepidermal CD8+ T cells are not constitutional scientifically, but once they contribute to the active CD3-TCR complex (NK) - sensitive prolific killer or NK-Resistant tumour cells and some keratinocytes are involved in the cytolytic activity. They produce large amounts of IFNg without dissemination, which are activated in vitro and in vivo. The use of Patch testing, Biopsy and oral provocation is mainly used to check the cross strain of drugs. Time is also given importance in the explosive of a certain drug. In this review, we focus on how the presence of intraepidermal CD8+ T cells resident in the fixed drug eruption lesions can provide exciting new ideas and clues to our understanding of patho-mechanisms of inflammatory skin disease.

Keywords*: Fixed drug eruption, Adverse drug reactions, CD8+T cells, Hyperpigmentation, ADR.*

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Understanding Tablet Defects in Commercial Transfer and Manufacturing

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Abstract: Tablet defects can come from any of the unit operations upstream and from the tablet press. The raw materials may be of poor quality or do not meet specifications, causing excessive fines that lead to a host of defects. The formulation may be the source of defects if the material does not compress well or the processing step specified within the formulation fail to produce a powder a good flow, compressibility, and ejection properties. The processing and granulation of powder is often the source of the defect. Every product behaves differently on a tablet press, even if it's the same product run on a different day. The variation often stems from changes in the properties of the raw materials- active ingredients and excipients- from batch to batch. Naturally, the goal is to minimize these changes. Tablet press operators, however, don't have any control over formulation and granulation. Tablet specifications are tight, and the list of possible defects is long: variable weight, sticking, picking, capping, lamination and variable hardness, among others. This article focuses on these variations. It pinpoints the possible causes of these defects and offers advice on preventing and fixing the source of the problems. The effect of tablet tensile strength, drop height, a number of drops and formulation on the propensity of tablet defects was investigated using modified tablet drop tests. It was found that increased drop height and number of drops increase the likelihood of tablet breakage; whilst increasing tablet tensile strength and using formulations with a high microcrystalline cellulose content provides some level of resistance against such defects. In addition, the present work highlights that common industrial tensile strength targets (1.7–2.0 MPa) may not, in some circumstances, be sufficient to prevent tablet defects during manufacture and transfer. Lastly, the current work also suggests that tensile strength, toughness and Young's modulus may not be suitable parameters in predicting the likelihood of tablet defects and damage arising.

Keywords*: Capping, Compression, Cracking-drop-test, Tensile strength, Tablet defect, Toughness, Young's modulus.*

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Pharmacognostic & Pharmacological Profile of Herbal Medicinal Plant *Caesalpinia pulcherrima*

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Abstract: Herbal drugs have become a popular form of healthcare. Even though several differences exist between herbal and conventional pharmacological treatments, herbal medicine can be tested for efficacy using the conventional trial methodology. Because of the current popularity of herbal medicine, research in this area should be intensified and Caesalpinia pulcherrima, a plant widely used in the traditional medicinal systems of India for the treatment of atonic diarrhoea and dysentery, rheumatism, haemorrhages and to treat wounds. Pharmacologically it has been reported to possess antibacterial, anti-inflammatory, antioxidant, anticancer and immunosuppressive activities. The present study highlights some of the phytochemical and pharmacological aspects of the plant which have been searched during their detailed study.

Keywords*: Caesalpinia pulcherrima, Pharmacognostic, Pharmacological, Antibacterial, Antiinflammatory, Antioxidant.*

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Scenario of Microbiology in Pharmaceutical Industries

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Abstract: Microbiology is the study of microorganisms such as bacteria, protozoa, fungi and similar organisms that cannot be seen with the naked eye. The roles of microbiology in the advances in the healthcare industry, especially in the pharmaceutical and medical industries have led to great discoveries, from vaccines to devices. Macrophages play an important role in the immune system because they are capable of ingesting microbes that enter our body through open wounds. The growth of cosmetic industries also parallels microbiological innovations. Industrial microbiology is the branch of applied microbiology in which microorganisms are used for the production of important substances, such as antibiotics, food products, enzymes, amino acids, vaccines and fine chemicals. Microbiologists working today have considerable choices in the range and type of culture media available to them. This has largely arisen from the expansion of microbiology from medicine in its early days to agriculture, food manufacturing, and water production applications with each discipline having its particular and individual requirements for culture media. In addition, culture media, initially developed for a particular requirement, have sometimes later been successfully adopted for use in other disciplines of microbiology. Microbes could adapt and mutate rapidly which results in opportunistic infectious diseases. On the contrary, microbes can also help us in ways like the way the good bacteria lactobacillus functions in our digestive system. In the case of pharmaceutical microbiology, however, a rather more conservative approach has been taken over the introduction of new media. The range of media used has remained largely consistent over the years.

Keywords*: Microbiology, Pharmaceutical industry, Antibiotics, Industrial microbiology, Scenario, Vaccines.*

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Nanostructured Lipid Carriers: A Novel Targeted Drug Delivery

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Abstract: Nanostructured lipid carriers (NLCs) are drug-delivery systems composed of both solid and liquid lipids as a core matrix. It has been shown that NLCs provide therapeutic benefits for drug delivery over traditional carriers, including enhanced solubility, greater permeability and bioavailability, fewer side effect, longer half-life, and tissue-specific targeted delivery. In addition, NLCs have garnered significant attention, and many researchers are now exploring NLC components and ligands to boost the efficacy of NLCs. As a result, nanotechnology has the potential to open exciting new fields of study in biomedical research.

Keywords*: Nanotechnology, Nanostructured lipid carriers, NLCs, NDDS, Targeted drug delivery.*

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Mushroom: A Food and Medicine

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Abstract: Mushrooms have been utilized by humans as food and medicine since the dawn of time. Since they have been used for so long, mushrooms provide a wide variety of medicinal benefits. One of the wild mushrooms used has a strong flavor and health-promoting properties. It is called *Morchella esculenta*. The most valuable and costly member of the Morchellaceae family of mushrooms is *M. esculenta*, also known as Guchhi. Due to the presence of several active constituents, it has a broad variety of pharmacological effects including antioxidant, anticancer, antibacterial, and anti-inflammatory qualities. It also acts as an immunological stimulant. Tocopherols, carotenoids, organic acids, and phenolic compounds are only a few of the active components found in *M. esculenta*. There are three types of tocopherols: α-tocopherol, γ-tocopherol, and δ-tocopherol. Carotene and lycopene are both found in carotenoids. Oxalic acid, malic acid, citric acid, fumaric acid, and quinic acid are examples of organic acids. Phenolic substances include protocatechuic acid, p-hydroxybenzoic acid, and p-coumaric acid. Dietary fibre (chitin), essential and semi-essential amino acids, unsaturated fatty acids, including linoleic and linolenic acids, easily digestible proteins, sterols, phenolic and indole compounds, and vitamins- particularly provitamin D2 and B1, B2, B6, B7 and C are all present in the *Agaricus bisporus*, also known as the button mushroom. *M. esculenta* gives a broad variety of research activities when evaluating the Morchella mushroom to the *A. bisporus*.

Keywords*: Mushroom, Morchella esculenta, Agaricus bisporus, Medicine, Guchhi, Button mushroom.*

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Nanosponge: A Novel Drug Delivery

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Abstract: The ideal delivery system will solubilize the drug and help the drug reach the target site. Nanosponges have a three-dimensional network with nanometric-sized cavities. These are very small sponges, about the size of a virus, that may contain a range of drugs it may be hydrophilic or hydrophobic. These loaded drugs are released in a controlled and predictable manner. These tiny sponges travel in the body until they reach at the target site and are released. Nanosponges are one of the excellent drug carriers that overcome the issues of drug toxicity and low bioavailability. Moreover, the aqueous solubility of these sponges is another crucial quality; it enables the successful use of these systems for drugs with low solubility.

Keywords*: Nanotechnology, Nanosponges, Cross-linking agent, Targeted drug delivery, Cancer.*

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Coumarin: A Promising Anti-Bacterial Agent

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Abstract: Coumarins come under the benzopyrone family of chemicals. which are all composed of a pyrone ring attached to a benzene ring. The coumarins belong to the benzo-α-pyrones, which are a subgroup of the benzopyrones, while the flavonoids are the major members of the benzo-γ-pyrones. Most coumarins can be found in Umbelliferone, Esculetin, and Scopoletin. These chemicals need ortho-hydroxylation of p-coumaric, caffeic, and ferulic acids for their production. The pharmacological characteristics of coumarins are of considerable interest. The new therapeutic agents are exhibiting physiological, bacteriostatic and anti-tumour action upon backbone derivatization. Over the last decade, several coumarin-based antibiotic hybrids have been developed, and many have shown promise as prospective antibacterial agents.

Keywords*: Coumarins, Benzopyrone, Benzo-α-pyrones, Anti-bacterial agents, Anticancer agents, Antibiotics.*

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The Evolving Scenario with Pharmacognosy

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Abstract: One of the oldest scientific fields, pharmacognosy, is currently undergoing significant change. With the exception of select medications, synthetic pharmaceuticals have steadily overtaken plant-derived medications. However, modern medical research and formulation are currently being done on plant-based medications. An increased interest in natural resources is a result of developments in biotechnology, biochemistry, and metabolism research. Recent developments in extraction, chromatography, hyphenated procedures, natural product screening, and the use of biotechnological technologies in natural research have made pharmacognosy knowledge necessary. Biotechnology's quick development has created new opportunities for pharmacognosists to advance the study of natural products. Newer methods are becoming more and more well-liked because they are more sensitive and specific than traditional ones. On this foundation, one must comprehend the fundamentals of pharmacognosy and how they relate to contemporary methods. The goal of this study is to encourage enthusiastic natural product researchers to focus more on herbal medicines by consolidating current technologies and attempting to attract attention to the evolving demands and scope of pharmacognosy. We can also take the example of *Pterocarpus marsupium* Roxb., which is grown for its high-quality wood as well as for its bioactive chemicals used in pharmaceuticals, particularly from the stem bark and heartwood. However, if current advancements in biotechnology are coupled with technological transfer to underdeveloped regions, they might provide a solution to the overexploitation of such valuable species. Because of its interdisciplinary and adaptable approach, the subject is still of utmost importance in the age of biotechnology and bioinformatics. In addition to the more conventional analytical method development and phytochemistry, pharmacognosy study now also covers elements of cell biology in connection to natural products, ethnobotany, and phytotherapy. Biologically active phytomedicines and their mechanisms of action, drug interactions, quality control, and participation in clinical trials are all topics that can be explored through the systematic study of herbal remedies.

Keywords: *Pharmacognosy, Phytochemistry, Phytotherapy, Phytomedicine, Biotechnology, Bioinformatics.*

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Antidiabetic Drugs in Ayurveda

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Abstract: Ayurveda, the Indian traditional medical science uses several drugs for the treatment of diseases derived from medicinal plants & minerals origin only. Since ancient times, Ayurvedic Acharyas have a very sound knowledge of diseases and their treatment among which diabetes mellitus is very known, i.e., Madhumeha. About 80% population of India still use ayurvedic medicine for diabetes. Diabetes (Madhumeha) is an important human ailment afflicting many people from various walks of life in different countries. This review focuses on Ayurvedic drugs like plants and minerals in single or compound form in various research institutes and articles. A list of Ayurvedic drugs having antidiabetic potential and their benefits in the treatment of diabetes is compiled. These include *Trivanga Bhasma, Triphala Churna, Terminalia chebula, Nimbapatra, Ashvattha, Acacia arabica, Mangifera indica, Eugenia jambolana, Allium cepa, Allium sativum, Aloe vera, Tinospora cordifolia*, etc.

Keywords*: Ayurveda, Minerals, Antidiabetic, Madhumeha, Medicinal plants, Diabetes mellitus.*

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Dispute with Vaccines During Covid-19

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Abstract: In India, the COVID-19 vaccination campaign was in full swing. The world's largest vaccination programme was launched by India on January 16, 2021, with the goal of vaccinating 300 million members of priority groups against the coronavirus illness (COVID-19). While the government worked hard to boost confidence and encourage people to come forward and take the made-in-India Covid-19 vaccine, many people were unsure which immunization to choose and many were uninformed of how these two vaccinations differed from one another (Covaxin and Covishield). Pharma companies and laboratories throughout the world are making an extraordinary effort to develop a safe and effective vaccine at this time. Many COVID-19 candidate vaccines are competing for authorisation from the relevant authorities based on their clinical efficacy and safety. People are still worried about their use, though. On January 3, 2021, the Drugs Controller General of India (DCGI) granted initial approval for the restricted emergency use of two COVID-19 vaccines in India: Covishield and Covaxin. Sputnik-V, a second COVID-19 vaccine sold by Dr. Reddy's Laboratories, received approval later. A systematic approach to vaccine markets and procurement is necessary to ensure access to inexpensive, sustainable, and quality-assured supply. Herd immunity among the communities, which is required to stop the spread of the disease, is the sole method of combating the illness until treatment is discovered. A suitable vaccination must be used to achieve herd immunity; it must be safe, effective, and able to be produced and distributed in sufficient numbers to fulfil the world's needs. It should also be able to prevent future infections. Few people still have concerns about the safety, effectiveness, and general acceptability of the Covid-19 vaccination.

Keywords*: Covid-19, Vaccination, UNICEF, Population, Acceptability, Covishield, Covaxin, India.*

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Nutraceuticals: A Need of Modern Era

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Abstract: Nutraceutical is a comprehensive term that is used to describe any product derived from food sources with extra health benefits in addition to the basic nutritional value found in the food that is taken by the human being. Nutraceutical is the term obtained by the combination of the two words, i.e., "nutrition" and "pharmaceutical". The name was coined in the year 1989 by Dr. Stephen DeFelice, who is the founder and chairman of the Foundation for Innovation in Medicine, which is an American organization located in Cranford, New Jersey. Nutraceuticals are those food or supplements containing bioactive compounds as active principles. Phytochemicals and antioxidants are two types of nutraceuticals. They have become a very significant source of nutraceutical ingredients. These are pharmaceutical forms such as capsules, pills, vials, powders, etc. The food products or the supplements used as a nutraceutical can be categorized as prebiotics, dietary fibre, polyunsaturated fatty acids, probiotics and other different types of herbal/natural food products or supplements. The aim of this review is to focus on the general concept and the health-promoting effects of several nutraceuticals that are incorporated in the form of foods. Nutraceuticals may be used to improve health, delay the ageing process, prevent chronic diseases, enhance human life or support the structure and function of the body. In the present review, nutraceuticals act as antioxidants species which are continuously produced during the physiological cellular metabolism.

Keywords*: Nutraceuticals, Antioxidants, Health effects, Nutrition, Pharmaceutical, Novel food.*

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Polypharmacology and Drug Discovery

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Abstract: A new paradigm in drug discovery called polypharmacology is beginning to emerge. Drugs have been regularly pulled off the market in recent years despite notable scientific improvements and a large rise in global investment in research and development. Known as polypharmacology, drug molecules frequently interact with a variety of targets; these unexpected drug-target interactions may result in negative side effects. The clinical drug chest is expanding quickly thanks to new innovations and drug discovery methods, giving clinicians new ways to treat patients and a greater knowledge of the disease. It continues to be a significant obstacle in drug development and provides fresh opportunities for the logical design of the next generation of therapeutic agents that are more potent yet less harmful. According to polypharmacology, numerous targets can be specifically modulated to create medications that are more potent. The general consensus is that sophisticated therapeutic techniques may be necessary for treating disorders of the central nervous system and cancer. Studies on polypharmacology may reveal brand-new off-targets for currently available medications. To find polypharmacological associations, there are numerous similarity-based, network-based, and structure-based techniques available. Polypharmacology modelling still faces a number of difficulties, and the logical development of multitargeting drugs is a very difficult task. You can use polypharmacology to find new medication off-targets. This is crucial for predicting the potential negative effects of novel medications that are currently being developed. The main drawback is that we only have a basic understanding of the molecular mechanisms underlying many diseases. Identification of a protein target, methods for creating compounds that interact with the target in a desirable way, and creative delivery strategies are all necessary for the development of new drugs. How to rationally develop ligands with a desirable polypharmacology profile and turn them into therapeutic candidates will be the next difficult task.

Keywords*: Polypharmacology, Multi-targeting drugs, Drug discovery, Side effects, Network-based.*

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Ashwagandha: A Potentially Active Medicinal Herb

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Abstract: Ashwagandha (*Withania somnifera*) is commonly known as Indian winter cherry or Indian ginseng and is also one of the most important herbs of Ayurveda. The name Ashwagandha is obtained from the combination of two words, i.e., Ashva, meaning horse, and Gandha, meaning smell. The root has a strong fragrance that is described as "horse-like." It improves the body's defence against disease by improving cell-mediated immunity and acts as an immune booster. It also possesses effective antioxidant properties and helps to protect against cellular damage caused by free radicals. Ashwagandha is considered an adaptogen which means that it promotes balance in different systems of the body. It can help the body to adapt itself to stressful conditions. Rasayanas described as a herbal preparation or tonic that promotes a young state of physical health and expands happiness and joyfulness. The present review focuses on the use of ashwagandha and its potential for the treatment of various kinds of disorders for the welfare of mankind. Ashwagandha has been extensively studied over its four eras of use. This herb helps to support the adaptogens like Eleuthero which is sometimes called Siberian ginseng, because of this it is known as Indian Ginseng which is an unrelated species that provides calming and nourishing stress support, while Ginseng supports energy and stamina.

Keywords*: Withania somnifera, Ashwagandha, Immunity booster, Stress reducer, Erectile dysfunction.*

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Challenges and Opportunities for a Respiratory Disease Intervention

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Abstract: The respiratory tract has developed defense mechanisms to keep inhaled medication particles out of the lungs and to remove or inactivate them once deposited, making pulmonary drug administration relatively complex. In addition to these behavioural obstacles of poor adherence and subpar inhaler technique, pulmonary medication delivery is also negatively impacted by these mechanical, chemical, and immunological barriers. Recent studies have found that the treatment of respiratory disorders treated with inhaled medications, particularly asthma and chronic obstructive pulmonary disease, needs to be improved (COPD). While some individuals frequently have poor inhaler technique, healthcare providers, especially those in primary care, appear to lack some of the evidence-based knowledge needed to choose the best respiratory drug delivery devices (inhalers) for the patients. Over the past 40 years, very few new classes of safe and effective medication have been developed, despite the fact that there are many unmet medical needs in the field of respiratory medicine. With fewer medication candidates and a greater failure rate than other common illness areas including cardiovascular, metabolic, and neurological diseases, respiratory medicine appears to have fewer new authorized medicines despite its tremendous burden. Additionally, like in other fields of drug discovery, drug development takes longer and has a higher probability of failure, which drives up development costs. These include creating regulatory frameworks required for better respiratory medication development and creating preclinical illness models that are more predictive. The patient must be able to perfect the inhaler technique needed for the particular inhaler for it to work at its best. The patient-inhaler interfaces, such as mouthpieces or facemasks, might present significant difficulties that further reduce the effectiveness of the therapy. Therefore, it is likely that products and medications that can set themselves apart by enhancing patient outcomes will gain market share.

Keywords*: Respiratory diseases, Asthma, Chronic obstructive pulmonary disease, Inhalers, Patient-inhaler interfaces.*

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Transdermal Drug Delivery System

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Abstract: Skin has various restrictions and obstacles which restrict the delivery of drugs through the stratum corneum to overcome this various carrier systems are invented, which are used transdermally for the effective delivery of drugs. A transdermal drug delivery system is a technology which is formed to control the activity of drugs in cells, tissues and other parts of our organ system. Transdermal drug delivery system minimizes the side effects of other delivery systems. In this delivery system drug is administered through the skin directly into the systemic circulation. Transdermal drug delivery is a safer route for administration because it overcomes and counteracts the problems and challenges of conventional drug delivery systems. In the conventional delivery system, the main problem is first-pass metabolism which is completely overcome by the transdermal drug delivery system. Transdermal delivery is useful among children and old age people and is easily accepted because of its ease of administration. Transdermal delivery is not only used for the delivery of pharmaceuticals, but also for cosmeceuticals. This review includes various types of transdermal delivery methods, with their characterization, and the benefits of the transdermal delivery system.

Keywords*: Transdermal delivery, Skin, Nanovesicles, Drug delivery, Novel drug delivery systems.*

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Corona Virus: A Major Threat to Mankind

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Abstract: Emerging infectious diseases, such as SARS and Zika, present a major threat to public health. A severe respiratory disease (Coronavirus) originated in the city of Wuhan, China in December 2019. At least 1,975 cases have been reported up to the 25th of January 2020. The first patient was hospitalized on the 12th of December 2019. The Pandemic spread with a high velocity across the globe within a short period of time. Metagenomic RNA sequencing of a bronchoalveolar lavage fluid sample identified a novel RNA virus from the family Coronaviridae, designed here as WH-Human-1 coronavirus. Phylogenetic analysis of the complete viral genome (29,903 nucleotides) revealed that the virus was most closely related (89.1% nucleotide similarity) to a group of SARS-like coronaviruses previously sampled from bats in China. Coronavirus is a large family of viruses that cause illnesses ranging from the common cold to more severe diseases such as middle east respiratory syndrome (MERS-CoV) and severe acute respiratory syndrome (SARS-CoV). A novel coronavirus (nCoV) is a new strain that has not been previously identified in humans. Coronavirus is transmitted through droplets and physical contact. Common signs of infection include respiratory symptoms, such as fever, and cough, shortness of breath and breathing difficulties. People need to be encouraged to practice handwashing with soap and water and observe social distancing for the prevention of coronavirus. So, the present review holds the potential to generate data regarding the causes, dos and don'ts of this disease an individual can do regarding the welfare of mankind.

Keywords*: Coronavirus, SARS-CoV, Infectious diseases, COVID-19, Viral genome, Strain.*

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Wheat: A Review on Nutritional and Medicinal Properties

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Abstract: Wheat is a significant source of energy and starch, but it also contains significant amounts of a variety of nutrients that are necessary for good health, including protein, vitamins, dietary fibre, and phytochemicals. Since there are many different wheat quality standards, one product's requirements might not apply to another. Proteins, carbs, iron, and B vitamins like niacin and riboflavin are all present in wheat endosperm. In addition, it includes trace minerals and soluble fibre. Therefore, whole wheat, which contains wheat bran and wheat germ, offers defiance against conditions like constipation, ischemia, heart disease, diverticulum disease of the colon, appendicitis, obesity, and diabetes. A deficiency in this vitamin can cause heart disease. Constipation and other digestive and nutritional issues are very common as a result of the loss of vitamins and minerals in refined wheat flour. With a protein level of roughly 13%, which is rather high when compared to other major cereals, it is the main source of vegetal protein in human meals. Natural wheat provides a variety of health benefits, including the fact that every part of the entire grain carries nutrients that a person's body needs. The vital vitamin E found in the wheat germ, which is removed during the refining process, is also abundant. To enhance dough handling, flavour, and shelf life, bakery products often contain chemicals such as water, sugar, yeast, oxidizing and reducing agents, and emulsifiers. This review was studied for the nation's economy which is ultimately impacted by the health of the nation's consumer population, which is greatly influenced by nutritional qualities.

Keywords*: Wheat, Diet and health, Dietary fibre, Wheat grain composition, Phytochemistry, Phytochemicals.*

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A Comprehensive Review on *Vitex trifolia*

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Abstract: Since ancient times, medicinal plants have been utilized to treat a wide range of human diseases and are a rich source of novel therapeutics. *Vitex trifolia* is a member of the Verbenaceae family, most often found in coastal areas of Pacific Asia, including countries like China, Australia, Singapore, and India. This review article tries to give a thorough analysis of *Vitex trifolia*'s pharmacological properties, which typically include antioxidant, antinociceptive, anti-inflammatory and anticancer, fungicidal, bactericidal, wound healing, amenorrhea, hepatoprotective, mice repelling, antimalarial, trachea-spasmolytic and insecticidal properties. Due to the presence of distinct components, every part of the plant benefited. Casticin, persinogenin, artemetin, luteolin, penduletin, vitexicarpin, and chrysisplenol are a few isolated and known flavonoids found in *V. trifolia*. According to reports, these flavonoids have anti-inflammatory properties. The fruit and leaves contain luteolin-7-O-β-D-glucuronide, luteolin-3-O-β-D-glucuronide, isoorientin, orientinluteolin-glucoside, vitricine, 3,6,7-trimethyl quercetagetin, vitexin, 5-methyl artemetin, and 7-desmethyl artemetin.

Keywords*: Vitex trifolia, Pharmacological properties, Anticancer, Phytochemistry, Chemical constituents.*

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Role of Green Tea (*Camellia sinensis*) in Neuroprotection, Antiphotoaging, and Autophagy

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Abstract: One of the most popular drinks consumed worldwide, tea comes in many different varieties. Green tea (*Camellia sinensis*) possesses a high number of antioxidants as compared to other forms of tea. Green tea is composed of caffeine, polyphenols, saponin, minerals, and trace amounts of amino acids, vitamins, and carbohydrates. It is a potent source of exogenous antioxidants which nullifies the ROS & RNS and diminishes the effect of photo ageing. The phytochemicals present in green tea are known to stimulate the central nervous system and maintain overall health in humans. The in-vivo and in-vitro studies suggest that it increases the collagen and elastin content & suppresses collagen-degrading enzyme MMP-3 production in the skin and causes the anti-wrinkle effect. It is generally used to make skincare products without harmful substances and toxic preservatives. In addition, green tea has been found to have a great effect on left ventricular hypertrophy and insulin resistance in dyslipidemia. Its flower buds were found to possess various beneficial effects on the bio-functional systems such as anti-hyperlipidemic, hypoglycemic, anti-obesity, gastro-protective and anti-allergic pancreatic lipase inhibitors. Furthermore, green tea has also been reported to possess stress resistance and neuroprotective properties. EGCG is an abundant catechin present in tea, which decreases the neurotoxicity caused by Aβ as it activates glycogen synthase kinase-3β. Additionally, green tea polyphenols induce autophagy, thereby revitalizing the overall health of the organism consuming it. Literature reveals the anti-photoaging, stress resistance, and neuroprotective and autophagy properties of one of the most widely known functional foods-green tea. However, the precise mechanism behind the anti-photoaging effect of green tea needs to be explored more.

Keywords*: Camellia sinensis, Green tea, Neuroprotection, CNS stimulant, Antiphotoaging, Synthase kinase-3β.*

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Exploring Extraction Efficiency by using Different Extraction Techniques from *Emblica officinalis*: An Industrial Perspective

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Abstract: Extractive values are very useful for crude drug evaluation. It is one of the useful tools for the prediction of constituents present in the plant. The extraction of different phytoconstituents from *Emblica officinalis* has been of tremendous interest and potential. The need of the present study was to compare the extractive values obtained by using different extraction techniques. The study provides an idea of the efficiency of different extraction methods. The dried plant material was grounded into powder and extraction was performed using water as solvent. The different methods such as sonication, maceration and continuous hot extraction were considered in the experiment. Further, the filtrate was separated through filter papers and evaporated using a water bath for the determination of extractive values and comparison. The extractive values obtained using the Soxhlet apparatus is 16%, whereas extractive values using maceration were found to be 8.2%. The maximum extractive value using sonication was found to be 21%.

Keywords*: Caesalpinia pulcherrima, Pharmacognostic, Pharmacological, Antibacterial, Antiinflammatory, Antioxidant.*

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Standardization of Chyawanprash: A Polyherbal Formulation

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Abstract: Chyawanprash is one of the ayurvedic polyherbal medicine of the Indian system of medicine. Chyawanprash is used as a health supplement to enhance immunity and stamina since ancient times. The present work was carried out for the determination of quality and standardization through physicochemical parameters and their analysis. The sample was analyzed by employing standard analytical parameters such as colour, odour, taste, loss on drying, total ash, acid insoluble ash, and extractive value in different solvents along with thin layer chromatography (TLC) was carried out. In conclusion, standardization parameters can be used for evaluating the quality, purity and uniformity of the herbal formulation (i.e., Chyawanprash).

Keywords*: Standardization, Herbal formulation, Chyawanprash, Ayurveda, Quality audit, Immunity.*

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Scientific Approaches for Regulations of Phytopharmaceuticals in Different Countries: Perspectives in Clinical Research

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Abstract: Globally the herbal medicinal industries are driven by the increasing importance of plant-based natural products such as extracts, phytomolecules, essential oils, aromas and perfumes. The more advanced class of drugs termed as phytopharmaceuticals comprises an enriched fraction with at least four distinct chemical indicators and one biomarker. In most countries, herbal drugs are poorly regulated by health authorities. For most herbal drugs, efficacy and quality are not assured. Taking this into account, different regulatory agencies such as CDSCO, FDA and WHO define and establish criteria focusing on promoting safety, efficacy and quality by expanding the knowledge base and providing guidance on regulatory and quality assurance standards. The regulatory scenario regarding herbal preparations varies from country to country. In this review, regulatory requirements for herbal drugs in different countries regarding issuance of licenses for manufacturing, confirmatory clinical trials, pharmacological information, quality assurance standards, formulation details, stability studies etc. are being promoted as per relevant protocol. The new regulations for pharmaceuticals are in line with regulations in the United States, China and other countries involving scientific evaluation and data generation. These new regulations are expected to promote innovations which would encourage research in phytopharmaceuticals drug development for academia, researchers, and industry.

Keywords*: Phytopharmaceuticals, Regulatory authorities, Biomarkers, Phytomolecules, Natural products.*

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Investigating Applications of Fourier Transform Infrared Spectrophotometry in Triphala Churna Analysis

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Abstract: Triphala churna is an Ayurvedic Rasayana consisting of three components (Amla, Hadad and Baheda). It has antibacterial, anti-arthritic, analgesic, antiaging, antiviral and anti-inflammatory properties. Fourier transform infrared spectroscopy (FTIR) become now one of the fast and analytical tools. Recently, it is becoming a favourable technique for the analysis of herbal medicines. In the present work, an FTIR method was performed for the identification of gallic acid and its functional group in Triphala churna by using IR spectroscopy. The main aim of this study is to evaluate the essential functional groups of gallic acid in Triphala churna. The sample of Triphala churna was taken and pellets were formed by pelletization. The analysis was done with IR instruments. Further, the data was interpreted, and compared the result with the help of standard chemical spectra of gallic acid and got the relative phenolic v(OH) and carboxyl (OH). The present work provides an update for the analysis of Triphala churna using FTIR Moreover, it could contribute to herbal drug standardization and quality control.

Keywords*: Ayurvedic, FTIR spectroscopy, Triphala churna, Gallic acid, Herbal Medicine, Quality control.*

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A Wonder Pharmacophore in Drug Discovery: Styrylquinoline

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Abstract: Styrylquinoline is a quinoline molecule attached to phenyl rings by an unsaturated ethylene linker, creating a flat and stiff shape. Despite the molecule's severe toxicity and low selectivity, its synthesis was first described about a century ago. Numerous studies on the synthesis and antiretroviral activity of various styrylquinoline derivatives have been published over the past 20 years. Later, reports of these compounds' additional actions, including their antibacterial and anticancer properties, surfaced. In recent years, styrylquinolines have been thoroughly investigated for new pharmacological properties, which has increased awareness of the moiety. Here, we review the various stages of research and examine the range of styrylquinoline activity and their application in medication development.

Keywords*: Styrylquinoline, Quinoline derivatives, Pharmacophore, Drug discovery, Drug development.*

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Flavonoids as Potential Anticancer Agents

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Abstract: Cancer is a leading cause of death and includes uncontrolled cell proliferation leading to the abnormal growth of cells that invades the other parts of the body. Flavonoids are the phenolic compounds present in fruits, leaves, stems, bark and flowers. They have been known for their beneficial effects on human health and possess a variety of pharmaceutical, nutraceutical, medicinal and cosmetic applications. They have been divided into six subclasses including flavones, flavanones, isoflavones, flavanols, flavonols and anthocyanidins. They exhibit anticancer effects through a variety of mechanisms such as modulating ROS-scavenging enzyme activities, cell cycle arrest, inducing apoptosis and suppressing the cancer cell proliferation and invasiveness. To further improve the anticancer potential of flavonoids, a large number of analogues have been prepared by researchers all over the world. Therefore, flavonoids possess a remarkable potential for the development of potent anticancer agents.

Keywords*: Cancer, Anticancer, Flavonoids, Mechanism of action, ROS, Human health, Derivatives.*

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Plant-Derived Natural Products for Breast Cancer Treatment

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Abstract: Cancer is a leading cause of death worldwide. Among other cancers, breast cancer has been found to produce a maximum number of cases in 2020. Different factors including geographical, genetic, hormonal, oral contraceptives and modern lifestyle could be responsible for the development of breast cancer and a number of pathways such as control of growth factor activity, neo-angiogenesis, apoptosis, invasion and metastasis, immunological modulation and signal transduction can be targeted for breast cancer treatment. The various approaches used for the treatment of breast cancer include radiotherapy, chemotherapy, hormone and immunotherapy. The side effects associated with these conventional treatments such as non-selectivity, multidrug resistance and bioavailability are quite challenging. Therefore, there is a need for the development of better therapeutic agents for the treatment of breast cancer. Natural products have played a highly significant role in the treatment of a large variety of human diseases. Several plant-derived molecules such as vinca alkaloids, camptothecins and podophyllotoxins serve as effective chemotherapeutic agents for cancer treatment. However, many of the plant-derived natural products suffered from the limitations of poor water solubility and possess toxic side effects. To overcome these limitations, several structural analogues of natural products have been synthesized and possess potent anticancer effects with fewer side effects than their precursor molecules.

Keywords*: Breast cancer, Etiology, Molecular targets, Natural products, Vinca, Alkaloids, Derivatives.*

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Overview of Current Advancement of Pharmaceutical Nanotechnology

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Abstract: The term nanotechnology refers to those branches of science and engineering that make the material at the nanoscale. The fields of medicine, imaging techniques, diagnostic devices, drug delivery system and pharmaceuticals all show tremendous potential for nanotechnology. It is utilized as a cutting-edge treatment for diseases like diabetes, ulcer, cancer, neurological, cardiovascular and skin problems etc. Numerous nanodevices, such as nanoemulsions, micelles, nanoparticles, liposomes, nanocapsules, etc., are used prominently. The aim of this review is to highlight the present aspects of nanotechnology and its applications. The literature search was done by using Science Direct, PubMed, and Google Scholar. According to the literature survey, it has been found that nano-based formulations viz: nanoparticles, nanoemulsion, liposomes, and dendrimers have given the medical field a new approach, exhibiting delivery of drug to the target site, enhanced therapeutic effectiveness, increased bioavailability, reduce the dose and side effects. Doxil, abraxane, and sunscot are FDA-approved drugs which are used clinically. Nanotechnology provides a platform for advancement in the biotechnology, medical and pharmaceutical industries, which serves to improve the quality of patient life. To improve disease diagnosis and cures in a targeted manner, potentially long-lasting, and accurate, a novel nanomaterial must be developed.

Keywords*: Nanotechnology, Advance treatment, Target drug delivery system, Biotechnology, Pharmaceutical industry.*

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Commercial Biotechnological Expansion Using Artificial Intelligence Aspects

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Abstract: Commercial biotechnology implies the avail on-self of enzymes and microorganisms to fabricate modernized chemicals from infinite sources. Since of its association with reduced energy consumption, greenhouse gas emissions, and waste generation, commercial biotechnology is an exploded field. It is easier to capture and store a bundle of digital patient data with hi-tech advances in the recent era. As a result; affluent data, health records, medical imaging and other patient information that Artificial Intelligence (AI) captures, can assist to develop drugs faster and with a significant chance of victory in the pre-stages of drug creation. AI is a vastly growing field in pharmaceuticals and drug development which can further create some vaccines and medicines which would be impossible without using it in biomarkers, genome sequencing, protein designing, etc. Unlike the chemical industry; the biotech industry is still not competitive in the generation of chemicals, materials, biofuels, and last but not least pharmaceuticals. But; as the demand of the new era, it must be developed into the manufacturer of "next generation biotechnology" which must prove to be a low-cost substrate based on less freshwater consumption, energy saver, and have a long-lasting impact on the world. As a substructure, contamination-resistant microorganisms are the key to a fortunate next-generation commercial biotechnology that needs resistance to microbial or phage contaminations, available tools and methods for metabolic or fabricated bio-engineering. This takes Halomonas spp. for the production of polyhydroxyalkanoates under open- and continuous-processing conditions proposed for next-generation commercial biotechnology.

Keywords*: Biotechnology, Artificial intelligence, Biomarkers, Genome sequencing, Halomonas, Polyhydroxyalkanoates.*

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Preparation, Characterization and Evaluation of the Novel Co-Crystals of Cabazitaxel and Syringic Acid

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Abstract: Taxanes constitute an important class of anti-cancer agents, which are widely prescribed for the management of cancers like breast, lung and ovaries. These agents belong to the biopharmaceutical classification system (BCS) class IV, which are neither soluble in the aqueous systems nor permeable across the biological membranes. Due to these concerns only, the oral bioavailabilities of these drugs are too low. Looking into these concerns, it was envisaged to develop co-crystals of docetaxel with syringic acid. A catalytical amount of methanol was added to the mortar and the drug and the co-former were added in the equimolar ratios to the 100 µL of ethanol. Precisely, 83.6 mg of cabazitaxel and 19.8 mg of syringic acid were employed. The system was grounded in a clockwise manner, using a pestle. For 30 minutes the ground powder was placed in a vacuum oven, set at 165 °C. After cooling the powder was further vacuumed till its next usage. There are no reports on the development of the co-crystal of cabazitaxel and the present studies provide proof of concept that simple physical modification can alter the safety and efficacy of the drug. The present findings are encouraging and such systems can be further explored on the preclinical and clinical platforms. These systems can alter the pharmacokinetics and pharmacodynamics of loaded drugs and should be given chance and chemical modifications of the drugs can be bypassed.

Keywords*: Anticancer agents, Taxanes, Cocrystals, Cabazitaxel, Syringic acid, Solubility enhancement.*

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Bioadhesive Drug Delivery System: An Overview

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Abstract: Buccoadhesive drug delivery has become a subject of great interest in the pharmaceutical sector as it may efficiently overcomes the problems associated with conventional drug delivery system like first pass metabolism, poor water solubility and short biological half-life. Buccoadhesion may be defined as drug delivery system in which water-soluble polymers are used for adhesion so that a drug can be targeted to a specific region for prolong period. The methods of preparation involve solvent evaporation and direct milling. Buccoadhesive is a promising area for the systemic delivery of protein and peptides because rich blood supply in buccal mucosa act as platform for better absorption. The permeability of buccal mucosa can be manipulated by selection of appropriate design and formulation of right dosage form. The herbal drug industry has shown a remarkable contribution in health care system during past decades because more than 70% people are using herbal medicines for treatment of various diseases. Bucccal drug delivery system has immense potential in delivery of herbal medicinal products.

Keywords*: Buccoadhesion, Oral mucosa, Bioadhesive polymers, Drug delivery systems, Dosage forms.*

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Herbal-based Formulations for Treatment of Acne

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Abstract: There are various infectious diseases in human skin, and Acne is one of them. Due to the presence of bacteria known as Propiobacterium acne is highly responsible for Acne vulgaris and it also produces excess sebum with follicular hyper-keratinization. According to the data obtained from the study of acne patients, various factors are involved in acne production like genetic factors, androgens, inflammatory mediators of stress, hormonal changes and physiological factor. There are different herbal cosmetics present in the market like herbal lotions, gels, and creams to cure acne. These herbal products contain a variety of plant actives/extracts, that are highly effective against acne. The presence of acne on the skin causes redness and inflammation of the skin. There is a presence of many herbal products containing plant extracts with anti-inflammatory and anti-bacterial properties with no side effects. The present review provides an overview of different formulations based on plants involved in the treatment of acne.

Keywords*: Acne, Herbal formulations, Treatment of acne, Phytoconstituents, Medicinal plants.*

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Current Modernizes on Mucoadhesive Oral Film: A Split Toward Pediatric and Geriatric Patients

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Abstract: An increasingly popular alternative to the traditional dosage form is oral films. Many pharmaceutical researchers have been concentrating on oral films over the past few years in an effort to understand how oral films might function as cutting-edge medication delivery technology. The oral films are an effective method of drug delivery since they are easy for pediatric and geriatric to swallow, self-administrable, employed for both systemic and local action, and have a quick release of a drug. Due to its many benefits, the buccal route is becoming a more popular alternative to another conventional form of systematic medication administration. The medicine enters the systemic circulation directly through the oral mucosa, avoiding the first-pass hepatic metabolism and gastrointestinal drug degradation that are common during oral delivery. All researchers in the pharmacy field study primarily on patient compliance and in the case of oral films there is a size reduced and suitable thickness as compared to other delivery systems. Recently, intensive research has been done to develop and manufacture a drug delivery system that is more efficient, and safe. The buccal mucoadhesive film dosage forms are one of those delivery techniques. This method makes it simple to give medications with low bioavailability, high first-pass metabolism, and short half-lives. Buccal films can deliver topical drugs with extended-release effects and also bitter-taste drugs. This review article focuses on the manufacturing characteristics of films, their characterization, applications, and challenges in creating oral films, as well as the market potential with pediatric, and geriatric health psychology.

Keywords*: Oral cavity, Oral film, Mucoadhesive, Films, Formulation, Evaluation, Pediatric, Geriatric.*

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A Review of the Molecular Docking of Phytoconstituents Having Antidiabetic Activity Targeting Dipeptidyl Peptidase-IV

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Abstract: The most prevalent endocrine illness, diabetes mellitus, is caused by a problem with insulin production, insulin resistance, or both. It requires a multi-method- method approach because it disrupts the human body at various organ levels, making it challenging to follow a specific line of medical therapy. Plants contain various phytoconstituents having anti-hyperglycemic activity, approximately 1200 plant species with potentially useful hypoglycemic properties have been identified. To identify precise lead compounds for the desired action, plant species with the appropriate therapeutic potential have been carefully examined. the more efficient peptide in plants having anti-diabetic activity can be identified by using a molecular docking study. In this review, we focus on a literature survey of molecular docking performances by predicting, the binding affinity and interaction patterns of peptides were assessed against dipeptidyl peptidase-IV. Alpha-glucosidase and dipeptidyl peptidase-4 are enzymes involved in the metabolism of carbohydrates. These enzymes are inhibited, which lowers blood glucose levels. There are various types of herbs are available whose phytoconstituent provide antidiabetic activity by binding on this DPP-4 receptor-like *Momordica charantia, Pinus roxburghii, Wedelia calendulacea, Curculigo latifolia palmatine*, etc. The ligands with different conformations are tightly placed onto the map of the receptor protein's active site of this enzyme receptor, which encompasses non-polar and polar interaction sites, to ascertain the most advantageous interaction and energy management. The configuration with the greatest docking score for each chemical can then be derived.

***Keywords**: Antidiabetic, Hypoglycemic, Dipeptidyl peptidase-IV, DPP-4, Phytoconstituents, Docking.*

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An Ingestible Self-Orienting System for Oral Delivery of Macromolecules

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Abstract: Most people with diabetes often get insulin injections multiple times a day as it is the only solution for them to keep their blood glucose levels under control. Daily injections are challenging leading to lower patient compliance. However, scientists discovered to deliver insulin orally in the form of a capsule but due to the large size of insulin, it gets rapidly degraded and poorly absorbed and generally limiting its administration to parenteral routes. An oral biologic delivery system must aid in both localization and permeation to achieve systemic drug uptake. An ingestible self-orienting-millimetre-scale-applicator (SOMA) autonomously reorients to engage with GI tissue. It consists of a partially hollowed-out, polymer-and-steel capsule that houses a tiny, spring-loaded needle tipped with compressed, freeze-dried insulin. There is also a dissolvable sugar disk to hold the needle in place until the time is right. Once SOMA is ingested and reaches the stomach, it quickly orients itself in a way that its needle side rests against the stomach wall. After the protective sugar disk dissolves in stomach acid, the spring-loaded needle tipped with insulin is released, injecting its load of insulin into the stomach wall, from which it enters the bloodstream. Meanwhile, the spent SOMA device passes on through the digestive system. The newer delivery methods and technologies are rapidly becoming effective and have great potential to improve patient compliance, metabolic control and quality of life of persons living with diabetes mellitus.

Keywords*: Oral delivery, Diabetes mellitus, Self-orienting-millimeter-scale-applicator, Insulin, SOMA.*

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Stem Cells Use in Vitiligo

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Abstract: Vitiligo is an auto-immune disease that causes loss of skin colour in patches. It is caused by the lack of pigment called melanin in the skin. This melanin pigment is produced by the skin cells called melanocytes and is responsible for giving colour to the skin. By the topical applications of autoimmune inhibitors which are derived from mesenchymal stem cells (MSCs) as well as by introducing the MSCs intravenously, vitiligo disease can be treated. Autoreactive CD8+ T-cells are the agents that are responsible for the destruction of melanocytes. So, by the topical application of autoimmune inhibitors which are derived from MSCs and by introducing MSCs intravenously, successful promotion of re-pigmentation has been reported. MSCs and their derivatives suppress the proliferation of CD8+ T cells through the NKG2D pathway by inducing T-cell apoptosis. MSCs therapy helps to suppress the destruction of melanocyte cells through the NKG2D pathway and leads to successful re-pigmentation of skin lesions in vitiligo patients.

Keywords*: Vitiligo, Mesenchymal stem cells, MSCs, NKG2D, Melanin, Melanocytes, CD8+ T cells.*

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A Smart Blood Delivery System for Antibiotic

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Abstract: Drug delivery using natural biological vectors, is an emerging trend in the pharmaceutical domain. RBCs are stable, biocompatible, robust biological vectors, and have a long lifespan. Erythrocytes securely transport potent antibiotics to specific E. coli infection sites. A need for such research arises from the ongoing antibiotic resistance crisis. The scientists target the bacterial membrane in response to antibiotics. This research added a novel technique by altering the basic properties of the bacterial membrane with synthetic lipid molecules and converting it to a modified hybrid membrane. The strategic approach initiates functionalizing red blood cells by using them as drug carriers. These drug carriers transport certain drug molecules and anchor proteins to these membranes that target bacterial receptors. The updated research report provides supporting information for the effectiveness of Erythrocytes as potent antibiotic drug carriers. The aim of this study is to focus on the efficacy of RBCs as a drug carrier for potent antibiotics. The information gathered from published articles. The authentication of data is confirmed with the help of medical software such as Medscape. This blood delivery system shows promising results for potent antibiotics. Researchers concluded the study with successful results. Red blood cells are the smart blood delivery system in reducing antibiotic resistance.

Keywords*: E. coli, Erythro-Pmb, Erythrocytes, RBCs, Polymixin B, Smart blood, Novel drug delivery systems.*

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An In Silico Study on Antidiabetic Activity of Bioactive Compounds in *Reynoutria japonica*

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Abstract: Diabetes is the ninth leading disease of concern and globally can affect 700 million people by 2045 (according to WHO). Herbal medicines are considered a more reliable therapeutic option as compared to conventional drugs for diabetes due to their less toxicity and side effects. Herbal phytoconstituents/medicines have a greater therapeutic horizon as they are multi-targeted in their action. In the present study, the phytoconstituents present in Reynoutria japonica also known as knotweed, belonging to the family Polygonaceae were investigated for anti-diabetic activity. This plant consists of anthraquinones, glycosides and flavonoids including resveratrol, emodin, polydatin, quercitin, quercitrin, rutin, astragalin and kaempferol. The major compound of this plant is resveratrol, which has performed well under in silico screening parameters. It followed Lipinski's rule of five and has the highest binding affinity as compared to the reference compound. Further in vitro and in vivo studies are required to get a reliable result which can be used for the next step, i.e., clinical trials on human beings.

Keywords*: Antidiabetic, Diabetes mellitus, Resveratrol, In silico, Docking, Reynoutria japonica, Knotweed.*

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Development of Analytical Method Validation for Sildenafil Citrate by UV Spectrophotometry

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Abstract: A simple, sensitive, specific, spectrophotometric method was developed for the detection of sildenafil citrate in bulk drug and pharmaceutical formulations. The optimum conditions for the analysis of the drug were established. The λmax of the sildenafil citrate was found to be 291.4 nm. The method shows high sensitivity with a linearity of 8 to 60 µg/ml. The lower limit of detection and the limit of quantification was found to be 1.012 and 3.036, respectively. All the calibration curves showed a linear relationship between the absorbance and concentration and the coefficient correlation was higher than 0.99. The regression of the curve was Y = 0.0131x - 0.0191. The precision of the method was found to be 2.0325 ± 0.044. The sample solution was stable for up to 48 hours. The proposed method will be suitable for the analysis of sildenafil citrate in bulk drugs as well as pharmaceutical formulations.

Keywords*: Sildenafil citrate, Spectroscopy, Estimation, Method development, Validation, UV Spectroscopy.*

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Artemisia vulgaris: Traditional Cure for Diabetes

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Abstract: Artemisia vulgaris is a traditional Chinese herb believed to have a wide range of healing properties; it is traditionally used to treat numerous health ailments. The plant is commonly called mugwort or riverside wormwood. The plant is edible, and in addition to its medicinal properties, it is also used as a culinary herb in Asian cooking in the form of a vegetable or in soup. The plant has garnered the attention of researchers in the past few decades, and several research studies have investigated its biological effects, including antioxidant, anti-inflammatory, hypolipidemic and antimicrobial properties. Thujone, the active constituent of Artemisia species, can increase free insulin-stimulated glucose transporter by activation of adenosine monophosphate-activated protein kinase and thus increases glucose reuptake. In this review, various studies on the biological effects of *A. vulgaris* in diabetes are discussed along with the tests conducted and proposed mechanisms of action. This review will be of interest to the researchers working in the field of herbal medicine, pharmacology, and immunology.

Keywords*: Artemisia vulgaris; Diabetes mellitus, Antidiabetic, GLUT-1, Mugwort, Thujone, AMPK.*

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Pharmaceutical Nanotechnology: From the Bench to the Market

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Abstract: In the world of pharmaceuticals and medicine, nanotechnology is regarded as a recent and quickly developing sector. As drug delivery vehicles, nanoparticles provide a number of benefits in terms of increased effectiveness and fewer negative medication responses. Many other kinds of nanosystems, such as paramagnetic nanoparticles, carbon nanotubes, nanoemulsions, dendrimers, etc., have been created. The shape and properties of the developed nanoparticles are significantly influenced by the physicochemical properties of the starting materials and the method of preparation chosen. The most widely used methods for creating nanocarriers include the dispersion of preformed polymers, nano-spray drying, polymerization, coacervation, and supercritical fluid technology. The primary variables determining nanoparticles' physical stability and biological performance of the integrated drug are particle size, surface charge, surface hydrophobicity, and drug release. Numerous nanodrugs have been tested in clinical trials for a variety of indications and have been utilized in clinical practice for both therapeutic and diagnostic purposes. Nanoparticles are used to treat tuberculosis, renal disorders, skin problems, Alzheimer's disease and cancer. The benefits, varieties, preparation techniques, characterization techniques, and applications of nanosystems will be discussed in this review.

Keywords*: Pharmaceuticals, Therapeutic, Nanodrugs, Nanotechnology, Medicine, Drug delivery, Nanoparticles.*

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Traditional Chinese Medications for Alzheimer's

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Abstract: Alzheimer's disease (AD) is a neurological condition that worsens with age and is characterized by memory loss and cognitive decline. Amyloid plaques, apoptosis, dysfunctional autophagy, neuro-inflammation, oxidative stress, and mitochondrial dysfunction are the main features of AD. These are mostly employed as major markers for choosing probable pharmacological effects. Understanding the pathogenesis of AD and developing effective treatments are essential. Although the chemical medications now utilized for clinical applications of AD are successful in controlling the symptoms, they fall short of the desired preventative or therapeutic results. New methods of treating AD exists. Treatment for dementia in traditional Chinese medicine (TCM) dates back thousands of years. Various current pharmacological investigations have confirmed the effectiveness of many bioactive components derived from TCM for treating AD. The Lamiaceae family accounts for the highest percentage of the herbal medicines discussed in this review that are representative of TCM for the treatment of AD. TCM extracts and monomers may have therapeutic value in the treatment of AD.

Keywords*: Alzheimer's disease, Amyloids, Treatment, Dementia, Traditional Chinese medicine, Pharmacological effects.*

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Aquaporins as Diagnostic and Therapeutic Targets in Cancer

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Abstract: A class of water channel proteins known as aquaporins (AQPs) is found in many different human tissues and is in charge of moving ions and tiny solutes like glycerol. More than 20 different forms of human cancer have been shown to produce AQPs, and there is a strong relationship between their expression and the severity of histological tumours and the prognosis of cancer patients. In solid and haematological cancers, AQPs may also contribute to tumour-associated oedema, tumour cell migration and proliferation, and tumour angiogenesis, according to more recent research. As new therapeutic approaches, AQPs inhibitors in tumour cells and micro-vessels have been proposed. The current review provides an overview of AQPs structures, expression variations between healthy tissues and tumours, functions of AQPs, and their contributions to the emergence of various cancers, with particular attention paid to lung, colorectal, liver, brain, and breast cancers. It also discusses potential AQPs-target inhibitors. We draw particular attention to the significance of AQPs as biomarkers for both diagnosis and treatment. The suppression of AQPs may be a potential anticancer treatment.

Keywords*: Aquaporins, Cancer, Anticancer, Tumour cells, Cell migration, Proliferation, Diagnosis.*

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Lung Cancer: Recent Development and New Frontiers

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Abstract: Lung cancer remains the leading explanation of cancer mortality in men and ladies within the U.S. and worldwide. Concerning the 90th of carcinoma cases area unit is caused by smoking and also the use of tobacco products However, alternative factors like atomic number 86 gas (Radon), asbestos, pollution exposures, and chronic infections will contribute to respiratory organ carcinogenesis. Additionally, multiple genetic and purchased mechanisms of condition to carcinoma are planned. Carcinoma is split into 2 broad microscopic anatomy categories, that grow and unfold differently: Small-cell respiratory organ/lung carcinomas (SCLC) and non-small cell respiratory organ/lung carcinomas (NSCLC). Lung cancer is mainly diagnosed by Thoracentesis (sampling of fluid buildup spherically the lung), MRI of the chest, and endoscopic musculature ultrasound (EUS) with a diagnostic test. Treatment choices for carcinoma embody surgery, irradiation, therapy, and targeted medical aid. Therapeutic- modalities recommendations rely upon many factors, as well as the kind and stage of cancer. The responses to current customary therapies are poor aside from the foremost localized cancers. However, a higher understanding of the biology pertinent to those difficult malignancies may result in the event of additional efficacious and may be additional specific medicine. The aim of this review is to summarize the recent developments in carcinoma biology and its therapeutic methods and discuss the most recent treatment advances as well as therapies. In summary, for early-stage lung cancer, nivolumab and chemotherapy before surgery are effective.

Keywords*: Lung carcinoma, Modality, Prognosis, Carcinoma embody surgery, Therapeutics, Cancer.*

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Breast Cancer

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Abstract: Breast cancer is the most frequent malignancy in women worldwide and young women constitute a minority of breast cancer than older women. There are different kinds of breast cancer. But its type mainly depends upon which cell in the breast turns into cancer. They are ductal carcinoma in situ (DCIS), invasive ductal carcinoma (IDC), lobular carcinoma in situ (LCIS) and invasive lobular carcinoma (ILC). This poster addresses the epidemiology, diagnosis, and important developments in the treatment of breast malignancies as well as areas which require further studies. Breast cancer is diagnosed by a mammogram and breast magnetic resonance imaging (MRI). Breast cancer can be treated by surgery and hormonal therapy. Treatment strategies differ according to molecular subtype. Management of breast cancer is multidisciplinary, it includes locoregional (surgery and radiation therapy) and systemic therapy approaches. Future concepts in breast cancer aim at individualization of therapy as well as at treatment de-escalation and escalation based on tumour biology and early therapy response. next to further innovations, equal worldwide access to therapeutic advances remains the global challenge in breast cancer care for the future. This poster provides an update on the management of breast cancer in young women and is targeted at the treatment of breast malignancy.

Keywords*: Breast cancer, Breast screening, Prognosis, Carcinoma embody surgeries, and therapeutics.*

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HIV: Human Immunodeficiency Virus

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Abstract: AIDS (acquired immune deficiency syndrome) is a serious disease which is caused by HIV. HIV infection is a threat to mankind. The virus slowly destroys the human immune system thereby making the person more susceptible to a variety of other microbial infections. Generally, AIDS is transmitted by unprotected sexual intercourse, blood transfusions, and mother-to-child during pregnancy. The aim of this presentation is to impart information about HIV (human immunodeficiency virus). HIV infects vital cells in the human immune system like helper CD4 T cells and macrophages. After the development of oral antiretrovirals which leads to virologic suppression, HIV treatment and prevention have improved in recent years. Effective ART is helping to control the multiplication of HIV and increases the count of CD4 cells. There is a substantial decrease of approximately 23% in the number of new cases across the globe since the year 2010. Recent advancements in treatment and prevention along with easy access to services have greatly decreased the impact of HIV and AIDS worldwide. To end this global HIV epidemic, we have to develop an effective and safe vaccine. The duration of this epidemic is still cannot be predetermined and it clearly depends on how individuals, associations, nations and the world respond to the HIV threat currently and in the upcoming future.

Keywords*: Viral diseases, Human immunodeficiency virus, AIDS, Symptoms, Antiretroviral therapy, HIV.*

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Modern Therapeutics, Vaccines and Future Challenges in the Treatment of COVID-19

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Abstract: In 2019, there was an outbreak spread of novel coronavirus (n-CoV) also called (2019-nCoV). It is now known as the severe acute respiratory syndrome coronavirus 2 (SARS-Cov-2), a series of acute respiratory diseases in Wuhan, Hubei province, China in December 2019. The virus has caused morbidity and mortality at an unprecedented scale worldwide. The aim of this paper is to summarize the information regarding modern therapeutics, vaccines and future challenges in the treatment of COVID-19. The discovery of an mRNA-based vaccine along with several other vaccines proved to be a success story for the prevention of SARS-CoV-2 coronavirus. The development of preventive and therapeutic strategies against SARS-CoV-2 will be obtained only after in-depth studies on the virological profile of the virus. If we get the true classification of SARS-CoV-2 immune defense, it will help in the fast development of therapeutic strategies. Therapeutics against COVID-19 are also very much important as the vaccines are but still, there is no remarkable success gained in this area as in vaccine development. Many antibodies have been discovered for use against COVID-19 but all of them do not have a mechanism of action which is applicable to SARS-CoV-2. If the SARS-CoV-2 virus will replicate, it will hamper the production of the vaccine and there may be chances that it will become resistant to the glycoprotein spike that is used to create the vaccine.

Keywords*: Coronavirus, COVID-19, SARS-CoV-2, Antibodies, Vaccines, Therapeutics, Morbidity, Pandemic.*

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Drug Utilization Pattern of Angiotensin Receptor Blockers/ ACE Inhibitors in Hypertensive Patients in Tertiary Care Hospital

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Abstract: Hypertension is a persistent elevated systolic pressure of more than 140 mmHg and a diastolic pressure of more than 90 mmHg. Hypertension is one of the key threats to coronary heart disease, stroke, and premature death and is a leading risk factor for the global disease burden. The current national guidelines for the control of blood pressure comprise lifestyle modification including DASH eating pattern, sodium reduction, weight loss, increased physical activity, moderate consumption of alcohol along with pharmacological treatment including ARB and ACE inhibitors. The major objective of the study was to observe the drug utilization pattern of angiotensin receptor blockers (ARBs) and angiotensin-converting enzyme inhibitors (ACEIs) in hypertensive patients in tertiary care hospitals. The study was conducted at MMIMSR, MM(DU), Mullana and about 100 patients were screened. The drug prescription pattern of ARB/ ACE Inhibitors was reviewed and analyzed. On analyzing the results, Stage I hypertension was found to be more prevalent as compared to other stages of hypertension. Angiotensin Receptor Blockers were found to be a drug of choice for patients of both age groups, i.e., below as well as above 60 years. Among ARBs, Telmisartan was the most prescribed drug due to its excellent vasodilating efficacy. It was concluded that ARB is preferred more than ACE because it reduces the risk of cough and angioedema and is safer than ACE Inhibitors.

Keywords*: Hypertension, ACE, Angiotensin receptor blockers, Telmisartan, Vasodilators, ACE inhibitors.*

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Epilepsy in Children: An Overview

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Abstract: Epilepsy is the most common neurological disease in children and is characterized by a spontaneous tendency to recurrent and unprovoked seizures, there are 55,00,000, people with epilepsy in India, and about 10% of children have at least one seizure during the first 16 years and the incidence is highest in children under 3 years of age and decreases in older children. Treatment of epilepsy is done with AED by controlling the abnormal neuronal activity with antiepileptic drugs (AED) which is achieved by raising the neuronal threshold to electrical or chemical stimulation or by limiting the spread of seizures from their origin. More drugs are now available to treat epilepsy). AED therapy provides relief in approximately 70% of all children with epilepsy. Older antiepileptic drugs include phenytoin, carbamazepine, valproic acid and phenobarbitone whereas newer antiepileptic drugs include gabapentin, clobazam, levetiracetam, clonazepam, vigabatrin, topiramate, tiagabine and zonazimid. They have fewer side effects and few if any, drug interactions. The overall goal of AED therapy is to reduce the frequency of epileptic seizures and improve the quality of life of patients with the fewest possible side effects and the fewest possible concomitant medications while minimizing long-term side effects. Outcomes of AED treatment in children depend on several factors, including AED selection, dosing and monitoring, identification of the underlying cause, seizure type, and AED pharmacokinetic parameters. After discontinuation, approximately 70% of patients remain seizure-free, and most patients who relapse achieve seizure control by restarting the AED. If treatment with two or more AEDs fails, other treatments for drug-resistant epilepsy should be considered, including epilepsy surgery, vague nerve stimulation, and dietary therapy.

Keywords*: Seizures, AED, Epilepsy, Anticonvulsant, Children, Pharmacokinetics, Dietary therapy.*

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Therapeutic Approaches of Diabetic Nephropathy

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Abstract: Diabetic nephropathy (DN) is characterized by low glomerular filtration rates (GFR) and abnormally high amounts of urine albumin excretion. The pathogenesis of diabetic nephropathy is initiated and maintained by four causal factors, which can be broadly classified as metabolic, hemodynamic, growth, and proinflammatory or profibrotic factors. The damage in the cells can be induced by glucose which is independent of glycation such as by the activation of the hexosamine pathway, polyol pathway or protein kinase C pathway or through the generation of ROS. Patients with DKD now have more therapy choices thanks to recent developments in medicines such as sodium-glucose transport protein 2 inhibitors, endothelin antagonists, glucagon-like peptide-1 agonists and mineralocorticoid receptor antagonists. The following four options are available to diabetic patients who require renal replacement therapy: refusal of further uremia therapy, which results in a gradual deterioration of general health and eventually results in death, peritoneal dialysis (e.g., continuous ambulatory peritoneal dialysis, continuous cyclic peritoneal dialysis, machine-assisted intermittent peritoneal dialysis), Hemodialysis and a transplant for the kidneys (e.g., cadaver donor kidney, living related-donor kidney, living unrelated-donor kidney, living unrelated-donor kidney). Some plants, including *Terminalia chebula, Brassica oleracea, Anacardium occidentale* and *Benincasa cerifera*, among others, have demonstrated beneficial benefits on diabetic nephropathy.

Keywords*: Nephropathy, Diabetes, Diabetic nephropathy, GLP-1, SGLT2, Therapeutics, Pathogenesis.*

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Terminalia bellirica: An Overview

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Abstract: *Terminalia bellirica*, commonly known as baheda, beleric or bastard myrobalan, in Sanskrit called 'bibhitaki', belongs to the family Combretaceae, is one of the earliest medicinal plants mostly found in India, Nepal, Sri Lanka, Pakistan, and Bangladesh. The purpose of this study was to provide a thorough analysis of major phytoconstituents present in *Terminalia bellirica* and their medicinal properties. Fruits of *Terminalia bellirica* contain various phytoconstituents which have a different mode of action. Tannins, glycosides, phenols, flavonoids, ellagic acid, chebulanic acid, gallic acid and ethyl gallate are the major constituents of this herb that show a wide range of therapeutic effects (antioxidant, analgesic, antibacterial, anti-inflammatory, antiasthmatic, hepatoprotective, anti-cancer, antiarthritic, antipyretic and immunomodulatory activity). This study is concerned with pharmacological and pharmacognostic attributes of *Terminalia bellirica* that may serve as a source of advanced research for the scientific community.

Keywords*: Terminalia bellirica, Phenolic compounds, Analgesic, Antioxidant activity, Oxidative imbalance.*

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Sickle Pod: A Review

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Abstract: *Cassia tora* also known as Foetid Cassia Tora, Sickle Senna, Wild Senna, Sickle Pod, Coffee Pod, Tovara, Chakvad is a plant species of the family Fabaceae. The constituents of this plant have many therapeutical activities. Rural and traditional healers in Madhya Pradesh's Satpura region have employed the entire plant as well as particular portions including the roots, leaves, and seeds to treat a variety of diseases. This plant has made significant contributions to the modern herbal medicines development system. Seeds of *Cassia tora* contained emodin, subrofusarin, chrysophanic acid, 1,8-dihydroxy anthraquinone, beta-sitosterol rein like aglycones, cassiaside, rubro-fusarin, torosachrysone, quercetin, and its analogues. *Cassia tora* has been found to display various pharmacological activities. According to research, *Cassia tora* shows antioxidant activity, anti-microbial activity, antidiabetic activity, anti-inflammatory activity, immunostimulatory activities, and antigenotoxic properties. *Cassia tora* is one of the wild herbs which is well known for its medicinal attributes. The vast majority of research on medicinal plants is going on, therefore, it is crucial to give importance to the safety assessment of the bioactivities of medicinal herbs. Medicinal plants have powerful chemical components that can treat a wide range of illnesses. Due to the issue of drug resistance, the use of medicinal plants as raw material in the creation of new drugs is growing daily. In this review, we will discuss the pharmacological profile of the *Cassia tora* plant.

Keywords*: Cassia Tora, Pharmacological activity, Active Constituents, Antioxidant, Anti-inflammatory.*

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Myrica esculenta: An Overview

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Abstract: *Myrica esculenta*, commonly known as "kafal" is a wild evergreen fruit found primarily in Himachal Pradesh districts as well as in the Himalayan region of the mid-Himalayan range. It is well recognized in Ayurvedic pharmacopoeia because of its multidimensional pharmacological and therapeutic effects. Fruits are claimed to act as sedatives, carminatives, and antiulcer and bark is reported to be used as an astringent, stimulant, antiseptic, carminative and antirheumatic. Moreover, oil from the flower has been found to be useful in earache, diarrhoea, paralysis and inflammation. Roots are used in bronchitis, asthma, cholera and cough. Antioxidant properties due to the presence of myricetin and quercetin found in the bark and leaves can be helpful in lowering oxidative stress and protecting against neurodegenerative diseases. High levels of phenolics, flavonoids, saponins, tannins and natural pigments found in Myrica esculenta have anti-inflammatory, anthelmintic, anti-microbial, anxiolytic, mast cell stabilizing, hypertension and hepatoprotective. Therefore, there is a need to explore more properties of *Myrica esculenta* including its effectiveness against neurodegenerative disease.

Keywords*: Myrica esculenta, Kafal, Phytochemistry, Anticancer, Pharmacological effects, Neurodegenerative diseases.*

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IgA Nephropathy: An Insight Overview

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Abstract: IgA nephropathy, often known as Berger's disease, is the most common primary glomerular disease worldwide; however, its geographical distribution varies greatly. An antibody called immunoglobulin A (IgA) is important for the immune system because it fights against infectious microorganisms. However, in IgA nephropathy, this antibody builds up in the glomeruli, resulting in inflammation (glomerulonephritis), which gradually impairs the glomeruli's capacity to filter substances. Genetic factors may contribute to IgA nephropathy. Additionally, liver illnesses, such as cirrhosis, and chronic hepatitis B and C infections. Moreover, gluten, which is present in most cereals, causes this intestinal diso.0rder and infections like HIV and some bacterial illnesses lead to IgA nephropathy. It is a leading cause of end-stage kidney disease (ESKD) in young adults with biopsy-proven primary glomerular disease and children with lifelong urine abnormalities. In the United States, IgA nephropathy makes up 5–10% of all primary glomerular disorders. Urinalysis, level of creatinine and iothalamate clearance test is used for diagnosis and confirmed by biopsy. The renin-angiotensin blocker should be used to cure hypertension if proteinuria in the 24-hour urine sample steroids is more helpful. If crescents are present on the biopsy in the sample with more than 10 glomeruli, then cyclophosphamide is given. A corticosteroid such as intravenous methylprednisolone, or oral prednisolone therapy for a 6-month provides positive results. Tonsillectomy for patients with recurrent tonsillar infections. Kidney transplant is effective in patients with a rate of 20-60%. As the disease is aggressive presents makes the treatment difficult.

Keywords*: Nephropathy, End-stage renal disease, Berger's disease, IgA, Immunoglobulin A, ESKD.*

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Role of Terpenoids in the Management of Diabetic Nephropathy

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Abstract: Diabetic nephropathy (DN) is the foremost ailment resulting in end-stage renal damage. Chronic hyperglycaemia and hyperlipidemia are the foremost reason for disease progression. The disease is characterized by the severity of albuminuria and cardiovascular disorders. 20 to 40% of the global prevalence of DN is mostly reported to occur in individuals with diabetes, and nearly 28% of DN occurs in individuals with other renal disorders. The pathological mechanism is very complex with the involvement of innumerable targets and leads to multiple pharmacological effects. Thus, the scientific community is forced to work in search of safe and potent therapeutics that can tackle the complex pathology of DN effectively. The secondary plant metabolites categorized as terpenoids gained attention as potential therapeutics contrary to others for the management of diabetic nephropathy and other associated syndromes by their strong antioxidant activity and inhibition of advanced glycation and its associated products. This review focused on herbal therapeutics for the management of diabetic nephropathy. Moreover, different types of terpenoids, their biological sources, and proposed mechanism of action are explored for the development of a novel pharmacophore for diabetic nephropathy.

Keywords*: Diabetic nephropathy, Albuminuria, Therapeutics, Secondary metabolites, Terpenoids.*

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Miracle Plant Used in Management of Obesity

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Abstract: The genera *Dracaena* and *Sansevieria* (Asparagaceae) are still poorly resolved phylogenetically. Plants of these genera are commonly distributed in Africa, China, Southeast Asia, and America. Most of them are cultivated for ornamental and medicinal purposes and are used in various traditional medicines due to their wide range of ethnopharmacological properties. Extensive *in vivo* and *in vitro* tests have been carried out to prove the ethnopharmacological claims and other bioactivities. These investigations have been accompanied by the isolation and identification of hundreds of phytochemical constituents. The most characteristic metabolites are steroids, flavonoids, stilbenes, and saponins; many of them exhibit potent analgesic, anti-inflammatory, antimicrobial, antioxidant, antiproliferative, and cytotoxic activities. This review highlights the structures and bioactivities of flavonoids and stilbenoids isolated from *Dracaena* and *Sansevieria*.

Keywords*: Obesity, Phytochemicals, Flavonoids, Dracaena, Sansevieria, Asparagaceae, Saponins.*

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Lipids: A Major Contributor to Diabetic Nephropathy

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Abstract: The pathophysiology of diabetic nephropathy is too complex and involves a variety of pathways and mediators. Dyslipidemia has been identified as a major contributor to the process of diabetic nephropathy. Dyslipidemia and associated factors through a series of mediators, ultimately lead to an increase in oxidative stress which leads to DN complications. Major targets identified are SREBP1, LXR, FXR PPAR, CD-36, PKC, AGE/RAGE Pathway, and ferroptosis. The drug acting on these targets has shown improvement in DN patients. Various pre-clinical and clinical studies support the fact that antioxidants, anti-inflammatory agents, anti-hyperglycemic agents, and anti-hyperlipidemic agents are promising targets for DN. Therefore, in conjugation with other standard therapies, drugs acting on dyslipidemia should be a part of the regimen.

Keywords*: Lipid, Nephropathy, Dyslipidemia, Lipids, Diabetic complications, Antioxidant, Anti-inflammatory.*

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Food Supplement as A Source of Antioxidants

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Abstract: Damage to cells caused by free radicals is believed to play a central role in the ageing process and in the progression of the disease. Reactive oxygen species are believed to play a vital role in the pathophysiology of organ dysfunction. Their role as a common pathway of cell damage has been increasingly emphasized in adult respiratory distress syndrome, in central nervous system traumatic and hypoxic states, and as a cause of ischemic neurological deficits in haemorrhage. Antioxidants help prevent or stop cell damage caused by oxidants, inhibit oxidation or reactions promoted by oxygen and peroxides and protect the living body from the deleterious effects of free radicals. Research suggests that antioxidants aid in imparting longevity and overall health. Benefits of consuming antioxidant foods, herbs, teas and supplements include slower signs of ageing specifically skin, eyes, tissue, joints, heart and brain, healthier, more youthful glowing skin, reduced cancer risk, detoxification support, longer life span, protection against heart disease and stroke, less risk for cognitive problems, such as dementia, reduced risk for vision loss, disorders like macular degeneration and cataracts. These are also added to food or household products to prevent oxidation and spoilage. The three major antioxidant vitamins are beta-carotene, vitamin C and vitamin E. Common foods like tomatoes, carrots, pumpkin seeds, sweet potatoes, pomegranates, strawberries, kale, broccoli, grapes or red wine, squash, and wild-caught salmon are also rich in antioxidants. Besides being so beneficial, clear evidence of the efficacy of antioxidant therapies in improving survival has not been clearly demonstrated. However, single-component therapies for complex pathophysiological processes are rarely successful, and the role of antioxidants in the critically ill should be thought of as only part of a rational and logical therapeutic approach.

Keywords*: Antioxidants, Free radicals, Peroxide, Reactive oxygen species, Adult respiratory distress syndrome.*

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Flax Seed Emerging as A "Super Food"

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Abstract: Flax, commonly known as flaxseed or linseed or Alsi, is a flowering plant belonging to *Linum ussitatissium*, of family Linaceae. The plant is grown for its high oil and fibre content in India, Holland, Russia, and Britannia, where it is preferably grown on well-fertile, fine-textured clay soils. Flaxseeds have been widely used for their health-protective and medicinal properties. Morphologically flax seeds appear to be glossy brown in colour and are shaped like an apple pip which is about 4-7 mm long. Today, flaxseed is found in all kinds of foods, ranging from crackers to waffles to oatmeal. Flaxseeds are emerging as a "Super Food" and dietary supplement because they are rich in omega-3 fatty acids, cancer-fighting lignans and antioxidants. There are two categories of flaxseeds commonly available, brown and golden, which are equal in their nutrition content. The main difference between the two types is the amount of omega-3 fatty acids. Brown has more (about 59%) as compared to golden (about 51%). Dietary consumption of flaxseed prevents coronary diseases, cancer, diabetes, obesity, gastrointestinal disorders, renal trouble, bone disease and a variety of other ailments. Flaxseed contains a high percentage of α-linolenic acid (ALA), protein, dietary fibre, and lignans specifically secoisolariciresinol diglucoside. Interestingly, the health benefits of flaxseeds are mainly attributed to the presence of omega-3 fatty acid which is present in the form of ALA. ALA is beneficial for infant brain development, reducing blood lipids and cardiovascular diseases. Flaxseeds are a rich source of lignans, which may reduce cancer risk and at the same time possess antioxidant and estrogenic properties. Flaxseeds are rich in fibre, which may help to lower cholesterol and blood sugar levels. Flaxseed contains both soluble and insoluble fibre, which gets fermented by intestinal bacteria to improve bowel regularity and gut health.

Keywords*: Flaxseed, Alpha-linolenic acid, Dietary fibre, Secoisolariciresinol diglucoside, Lignans, Health benefits.*

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Phytochemistry of Several Medicinal Plants

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Abstract: Phytochemistry is the study of the phytochemicals of plants. Most phytochemicals are alkaloids, terpenoids, flavonoids, glycosides, tannins, etc. Medicinal plants are those plants which have therapeutic value such as *Tinospera cordifolia, Ocimum tenuiflorus, Aloe barbadensis*, etc. The main aim of the study is to evaluate the phytochemicals of the plants and study the therapeutic value of phytochemicals such as anti-inflammatory, anti-microbial, antiseptic and antibacterial activities. A phytochemical test was conducted for two plants and found various therapeutic properties. The extraction process is used to separate the phytochemicals from the medicinal plant. There is various method of extraction such as infusion, decoction, maceration, digestion, etc. The study plant extract of *Ocimum tenuiflorum* (leaves) had shown strong antiseptic, antibacterial, and antimicrobial activities and the plant *Aloe barbodensis* (leaves) had shown anti-inflammatory, anti-oxidant, and anti-diabetic therapeutic activities. This study provided evidence of the presence of medicinal compounds in the natural plants and extraction of medicinal plants are used for various treatments and diseases.

Keywords*: Phytochemicals, Anti-microbial, Anti-oxidants, Anti-inflammatory, Anti-diabetic, Anti-bacterial.*

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Mechanistic Approach for Treatment of Dengue Fever

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Abstract: Dengue is a highly widespread infectious disease in tropical and subtropical regions worldwide, mostly in urban and semi-urban areas and is rapidly becoming a global burden. It is currently one of the World's most important abandoned diseases and its incidence has increased >30-fold in recent decades alongside the geographical expansion of the Aedes vector mosquitoes and dengue virus. Dengue varies from mild fever to severe conditions of dengue hemorrhagic fever and dengue shock syndrome. Individuals aged 21 to 40 years old have the highest risk of acquiring the disease among adults. There is no specific treatment available for dengue. Early detection of disease progression associated with severe dengue, and access to proper medical care lowers the fatality rate of severe dengue to below 1.0%. Currently, the most advanced dengue vaccines are all tetravalent and based on recombinant live attenuated viruses. A vaccine to prevent dengue (i.e., CYD-TDV), developed by Sanofi Pasteur, has been approved but is limited for use in individuals with prior dengue infection. The search for new anti-dengue agents from phytochemicals was assumed to be highly emergent in the past. The demand for phytochemicals is based on medicines which are mostly considered to be safer, less harmful than synthetic drugs and nontoxic. The current studies showed that natural products represent a rich source of medicines for dengue fever.

Keywords*: Dengue, Hemorrhagic fever, Shock syndrome, Aedes vector, Anti-dengue agents, Phytochemicals.*

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Pyrrolopyrimidine: An Anti-Aancer Scaffold and Insight into Structure-Activity Relationship- A Mechanistic Review

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Abstract: After heart disease, cancer is the second most common cause of mortality. Cancer is the uncontrolled proliferation of cells. Neoplasms and malignant tumours are other words that are used. One characteristic of cancer is the quick development of aberrant cells that expand outside of their normal borders, infiltrate other body components, and eventually move to other organs. This process is known as metastasis. The main reason why cancer patients die is because of widespread metastases. Fused heterocycles are widely used in the field of medicinal chemistry because they have been shown to exhibit a variety of biological actions, including anticancer, antibacterial, antifungal, and anti-inflammatory effects. One of the main classes of fused heterocycles that receives a lot of attention in the literature is pyrrolopyrimidines. According to various investigations, the pyrrolopyrimidine molecule has a more powerful and diversified pharmacological profile than either pyrrole or pyrimidine nucleus alone. As anticancer medicines, various medicinal compounds based on the pyrrolopyrimidine scaffold have been created too far. Strong anti-cancer medications were discovered to include roxolitinib, tofacitinib, oclacitinib and baricitinib. As multi-kinase inhibitors, several urea-based anti-cancer medications that have received FDA approval include sorafenib, regorafenib and linifanib. In addition, in the past three years, hundreds of investigations on the synthesis and activity of the pyrrolopyrimidine ring have been published. We have discussed the most recent developments in the medicinal chemistry of pyrrolopyrimidine derivatives.

Keywords*: Pyrrolopyrimidine derivatives, Anticancer activity, Structure-activity relationship, Metastasis, Neoplasms.*

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Diabetes Mellitus – An Overview

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Abstract: Diabetes takes place when our frame is not able to absorb sugar (glucose) into its cells. This results in greater sugar levels in our bloodstream. Insulin is a hormone made by your pancreas; an organ positioned behind your stomach. Your pancreas releases insulin into your bloodstream. Insulin permits glucose to go into your frame's cells. When you have diabetes: your pancreas doesn't make any insulin or sufficient insulin. Type 1 diabetes is an autoimmune ailment, which means your body assaults itself. In this example, the insulin-producing cells in our pancreas are destroyed. It's typically recognized in children and young adults (but can expand at any age). In type 2 diabetes your frame doesn't make sufficient insulin or your frame's cells don't reply usually to the insulin. that is the most common kind of diabetes. Prediabetes: A type caused before type 2 diabetes mellitus. Your blood glucose levels are higher than ordinary but not high sufficient to be formally diagnosed with type 2 diabetes. Gestational diabetes: This kind develops in a few women during their pregnancy. Basic knowledge about diabetes mellitus, its types and risk factors. Diabetes mellitus is caused due to high sugar levels in the blood. Take a healthy and balanced diet to fight this disease. Over time, diabetes mellitus can damage the heart, blood vessels, eyes, kidneys and nerves.

Keywords*: Diabetes mellitus, Juvenile, Type 2 diabetes, Gestational diabetes, Prediabetes, Autoimmune ailment.*

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Diuretics: A Basic Outline

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Abstract: Diuretics are those substances which increase urine flow. It is widely used in the treatment of oedema, hypertension and heart failure. Pharmacological groups usually consist of five classes: thiazide diuretics, loop diuretics, potassium-sparing diuretics, osmotic diuretics, and carbonic anhydrase inhibitors. The classification and nomenclature of this traditional diuretic have remained unchanged over the past decades. Modern approaches in the field of pharmacological nomenclature suggest the introduction of mechanism-based drug class designations, but this has not yet been reflected in the diuretic group. Additionally, the included drug class has lost its relevance as a diuretic. For example, carbonic anhydrase inhibitors are primarily used to treat glaucoma. Newer drugs such as vasopressin-2 receptor antagonists and SGLT2 inhibitors also have diuretic properties. This review article discusses the relevance of the pharmacological classification of diuretics. We are developing changes in the area of nomenclature, and modern medical use of classic and novel diuretics. Diuretics are among the most commonly prescribed drugs and are used to promote water and electrolyte excretion via the kidney thereby increasing urine flow. The accumulation of fluid in body tissues is a result of the inability of the kidneys to release sodium and the lack of water that the kidneys remove. Diuretics are used to treat oedema, heart failure and hypertension.

Keywords*: Diuretics, Hypertension, Antihypertensive agents, Pharmacological intervention, SGLT2 inhibitors.*

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Ebola Virus: An Overview

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Abstract: Ebola virus disease is a severe, and usually fatal illness in humans and other primates caused by the Ebola virus The condition was formerly referred to as Ebola hemorrhagic fever. It has a high risk of death killing between 25% and 90% of people who are affected. The disease was identified in 1976. One in Nzara and the other in Yambuka near the Ebola River from which the name of the disease originated. In 2014, in some parts of west Africa, 28,616 cases and 11,310 deaths were reported. In this time period, most deaths were recorded. Ebola virus disease in humans is caused by an infection with the virus of the Eiboviridae family, genus Ebolavirus. The main types are Zaire, Sudan, Taire forest, Bunibuggo and Reston. Ebola spreads to the human population through contaminated blood secretions, and fluids of infected animals and also spread from human to human via tears, saliva, semen, breast milk, sweat, mucus, urine, and faeces. Entry points through which this virus enters inside the body are the mouth, nose, eyes, wounds, and abrasion. Signs and symptoms include high fever, sore throat, muscle pain and lack of appetite. Some patients may have symptoms like rashes, red eyes, difficulty swallowing, difficulty breathing, bleeding, cough and hiccups. Several tests can be performed including an antigen capture enzyme-linked immunosorbent assay to examine its infection. No proven treatment options are available for the condition though researchers are working on it. Only precautions can prevent the Ebola virus there is no treatment available.

Keywords*: Ebola virus, Hemorrhagic fever, Serological test, Diagnosis, Epidemiology, Treatment.*

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Epilepsy: An Overview

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Abstract: Epilepsy is a neurological brain disorder. It is characterized by recurrent seizures, and loss of consciousness with or without body movement. It is a chronic medical condition produces by sudden change in the electrical function of brain. Two or more unwarranted seizures is tha cause of epilepsy. The form of seizure is depend upon the part of brain affected, involvement of motor cortex produce turbulence, cerebellum cause peripheral autonomic discharge and reticular area cause loss of consciousness. Etiological factors involved are brain tumour, genetic cause, brain abnormalities, infection, high fever, alcohol withdrawal, head injury. Signs and symptoms are temporary confusion, loss of awareness, anxiety, constant staring. Epilepsy is very complex medical condition in which many effective treatment options are available. Seizure medication are the main treatment modality. It can occur by the sudden change in the electrical function of brain and it also occur due to an imbalance between inhibition & excitation.

Keywords*: Epilepsy, Seizures, Anticonvulsants, Neurological brain disorder, Antiepileptic drugs.*

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Hyperlipidaemia: An Overview

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Abstract: Hyperlipidemia also called dyslipidemia is a disease in which levels of Lipids including cholesterol and triglycerides increased in the blood. In adults, it is characterized by chest pain, high blood pressure and stroke. Lipids are fats that are present in the form of cholesterol. The liver needs cholesterol for the formation of bile acid used for digestion. There are several types of lipoproteins VLDL (very low-density lipoprotein) transports triglycerides used for energy, LDL (low-density lipoprotein) transports cholesterol, HDL (high-density lipoprotein) called greed cholesterol and carries a low amount of cholesterol and triglycerides. The amount of cholesterol must be in between 125 to 200 mg/dl and above 240mg/dl or greater is considered to be High. A person having more than HDL - 45mg/dl, LDL less than 100mg/dl, and triglycerides less than 150 mg /dl is good. The increased levels of bad cholesterol accumulate in blood vessels and lead to obstructed blood flow. In order to treat hyperlipidaemia, a combination of Statins and Ezetimibe are given. HMG Co-A reductase (3-Hydroxy-3-methyl glutaryl -Co-A) inhibits the conversion of HMG -Co-A to Mevalonic acid and thus LDL formation not occurs. If hyperlipidaemia is not treated in time, then it leads to stroke, high blood pressure and other cardiovascular diseases. In order to prevent hyperlipidaemia you need to reduce intake of meat, fried food and need to cooking with healthy oil.

Keywords*: Hyperlipidemia, Lipoproteins, Metabolic syndrome, Cholesterol, LDL, HMG Co-A reductase, VLDL.*

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Jaundice – Symptoms and Treatment

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Abstract: Jaundice is a complex disease. Jaundice is actually the high bilirubin level in the body. There are several forms of jaundice, including pre-hepatic jaundice (due to hemolysis of red blood cells), hepatic jaundice (due to defects in the capture, conjugation, and excretion of bilirubin by the liver) and post-hepatic jaundice (due to obstruction of the extra-hepatobiliary system). The causes of various forms of jaundice are either acquired or congenital. High plasma bilirubin levels can cause various manifestations including satiety, gastrointestinal bleeding, diarrhoea, anemia, weight loss, and oedema. Symptoms of jaundice are fever, chills, abdominal pain, dark-coloured urine, etc. All causes of jaundice can be treated, but this requires specialist consultation. Cases of jaundice should not be treated by quack doctors who often use herbs and ayurvedic medicines which turn out to be a potentially curable disease. Methods of Prevention are to avoid hepatitis infection, stay within recommended alcohol limits and maintain a healthy weight. Although the most common cause of jaundice is bile duct stones, cancers are present in more than a quarter of patients with jaundice in this study, demonstrating the importance of immediate investigation into the underlying cause.

Keywords*: Jaundice, Hyperbilirubinemia, Haemolysis, Obstruction, Symptoms, Treatment, Hepatic.*

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Pharmacovigilance: A Basic Outline

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Abstract: Pharmacovigilance is outlined as the pharmacological science associated with the detection, assessment, understanding and prevention of adverse effects basically long-term and short-term adverse effects of medicines. It plays a major and integral role in clinical research as it helps in monitoring the interaction of drugs and their effects on the human body. It assists the awareness of adverse drug reactions (ADR) that occur due to the use of various medicines. Pharmacovigilance is still in its infancy in India and there exists very confined knowledge about this field. So, there is a great need to understand the importance of pharmacovigilance and how it impacts the life cycle of any medicinal product. The utmost goal of this field is to improve the safe and rational use of medicines, thereby enhancing patient care and public health. Signal identification and management is an essential part of pharmacovigilance practices that try to obtain all of the information necessary for maintaining the safety profiles of a company's pharmaceutical and biological products, encouraging favourable benefit-risk balances, and ensuring safe use by healthcare providers and their patients. Through this article, we are going to discuss the pathway through which any drug come under the study of pharmacovigilance, its use in different fields of pharmacy and the softwares used in pharmacovigilance.

Keywords*: Pharmacovigilance, Signal identification, Software, Healthcare, Adverse drug reactions.*

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Schizophrenia: A Review

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Abstract: Schizophrenia is a nervous system disorder and is characterized by disturbance in thought process, emotional responsiveness and violation. It affects the whole person's body behaviour, mood, way of thinking and how they treat other people. Recent researches suggest that it is caused by physical, generic and some psychological factors that lead to developing this disorder. Signs and symptoms include hallucinations, delusions, people withdrawing from the world and being emotionless. It is mainly divided into paranoid schizophrenia (paranoia is a condition where a person feels suspicious about other people), and disorganized schizophrenia (roughly behaviour and speech). Childhood schizophrenia (hallucination occurs means seeing or hearing things that do not exist), catatonic schizophrenia (in this you might stand totally mute & still), schizophrenia disorder (mood changes hearing voices that are not real), etiological factors involving bad events like the death of loved ones and financial pressure from society. In this disorder, dopaminergic, glutamatergic and GABA-ergic (gamma-aminobutyric acid) neurotransmitters are affected and imbalance leads to develop schizophrenia. A combination of haloperidol, fluphenazine and chlorpromazine antipsychotics are given. It can be treated naturally by relaxing the mind with yoga, social skills training and by psychotherapy and severe condition can be treated by taking proper medications.

Keywords*: Schizophrenia, Psychotropic disorders, Paranoid schizophrenia, Hallucinations, Antipsychotics.*

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Thyroid Disorders: An Overview

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Abstract: Disorders of the thyroid gland are among the most common diseases of the endocrine system and can be divided into hypothyroidism, hyperthyroidism and thyroid cancer. Hypothyroidism is usually caused by surgical thyroidectomy or autoimmune destruction of the gland; it is reliably diagnosed and monitored by measuring thyroid stimulating hormone (TSH). Hyperthyroidism is usually caused by autoantibody-driven overproduction of thyroid hormone or over-secretion of the thyroid gland by a functional thyroid nodule. Diagnosis and treatment of hyperthyroidism are carried out by measuring TSH, free thyroxine and free triiodothyronine. Slightly different laboratory reference ranges may be required for thyroid hormone determinations to diagnose thyroid disease in pregnancy. Thyroglobulin and calcitonin are two common biochemical tumour markers useful in monitoring thyroid cancer. This review will focus on the clinical and biochemical features in the diagnosis and management of all three classes of thyroid disease with particular attention to special situations such as pregnancy and paediatrics. The thyroid gland releases thyroid hormones that can cause cardiac implications. Thyroid disorders can be treated by improving their diet and by taking medications.

Keywords*: Thyroid gland, Hypothyroidism, Calcitonin, Thyroid cancer, Thyroid stimulating hormone.*

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Preparation and Primary Characterization of Bovine Serum Albumin-Based Nanoparticle for Drug Delivery

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Abstract: In current research work we prepared a nano-based system for targeted drug delivery in which the drug is encapsulated into activated folic acid attached bovine serum albumin nanoparticles the drug for choice is celecoxib. The aim of the research work was to develop bovine serum-based nanoparticles to improve the bioavailability of poorly soluble drugs. Preparation of celecoxib-loaded BSA nanoparticles, NHS ester of folic acid and FA-BSA-celecoxib nanoparticles. Finally, per cent drug loading and encapsulation efficiency were done. After the conjugation to NHS folate with BSA-celecoxib, the solution was then centrifuged for 35 min continuously and then the supernatant was collected. At last various characterization studies were carried out for the physiochemical properties of the prepared sample such as FT-IR, size, zeta potential, polydispersity index SEM, and NMR. The NMR spectrum confirmed the successful conjugation of NHS with folic acid. The confirmation results were recorded by the dilution of the FA-NHS through deuterated dimethyl sulfoxide. Other analysis parameters also reveal the successful preparation of nanoparticles. This is very clear that the methods adopted for the preparation of nanoparticles are very scientific and have good results, in all ways. The prepared formulation showed good stability and drug release.

Keywords*: Bovine serum albumin, Characterization, Encapsulation, Bioavailability, Nano-based.*

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Nephrotoxic Repercussion of Phytomedicines: A Review

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Abstract: There is general belief that usage of ethnomedicine is most common among the weaker section of the human population & these peoples are frequently visits to the medical practitioner those are continuously practicing the drugs of natural origin mainly plant medicines. Thus, unwillingly several herbs are prescribed to the patient those have severe side effects on their vital organs. Such as so many herbal drugs induced toxic effects on the kidneys of a patient. This review article provides the information regarding the toxic impact of plant drugs on the functions of the kidney. simultaneously review is also very informative in context with the used of medicinal herbs in the treatment of several ailments as well as they also caused the kidney diseases. Nephrotoxicity can be defined as a toxicity associated with the kidneys. It occurs due to the result of few toxic chemicals as well as herbal medications prescribed by the health personals to patients also due to the self-medication by the patients. Thus, these certain substances are known as Nephrotoxins which induces the nephrotoxicity. Examples of some nephrotoxic herbal drugs are Asarum which is also known as wild ginger, impilea, noni juice, and djenkolic beans.

Keywords*: Ethnomedicine, Toxic, Nephrotoxicity, Practitioner, Medications, Phytomedicine, Kidney ailments.*

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In- vitro Evaluation of Anti-inflammatory Activity of Barley Grass

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Abstract: Barley (Hordeum vulgare L.) grass has received much attention recently as a functional food in many countries, especially Korea and Japan. It has been reported that barley is comprised of 48.6% polysaccharides, 22 % proteins, and 4.97% fats, phytosterols along with a variety of vitamins, minerals, and polyphenols. This study aimed to assess the anti-inflammatory activities of the petroleum ether (BPE), chloroform extract (BCE), hydroalcoholic (BHAE), and aqueous extracts (BAE) of barley grass. The inhibitory effect of barley grass was evaluated by protein denaturation, antiprotease, and anti-lipoxygenase methods. Results showed that amongst all extracts chloroform extract of grass of barley shows maximum anti-inflammatory activity. Barley extract denatured the protein in a concentration manner. It is proposed that the extract might inhibit the release of the lysosomal constituents of neutrophils at the site of inflammation by 15.0-81.0%. Proteinase inhibitory activity of grass of barley was within the range of 25.2-65.9% and inhibit the proteases released from leukocytes. Lipoxygenases are the key enzymes in the biosynthesis of leukotrienes, the extract of grass of barley inhibits the lipoxygenase by 10.7-76.0%. In conclusion, results revealed that all extracts of grass of barley possess anti-inflammatory properties at different levels, and this could be due to the differences in the composition and concentration of bioactive compounds.

Keywords*: Barley grass, Protein denaturation, Antiprotease, Leukocytes, Anti-lipoxygenase, Anti-inflammatory.*

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Cymbopogon: A Genus with Multifarious Potential

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Abstract: Cymbopogon, one of the major aromatic genera of the Poaceae family, is mainly cultivated for its essential oils that hold medicinal and commercial value. Cymbopogon genus possesses various pharmacological activities as well as high applicability as a common tea, medicinal supplement, insect repellent, insecticide, flu control, digestive disorders and cosmetics. The present abstract envisioned to outline a study based on Cymbopogon species. This review focuses on the therapeutic uses of species *Cymbopogon citratus, Cymbopogon flexuosus, Cymbopogon nardus, Cymbopogon jwarancusa, Cymbopogon schoenanthus, Cymbopogon winterianus, Cymbopogon martini, Cymbopogon densiflorus, Cymbopogon giganteus, Cymbopogon khasianus*. Their applications are insect repellent, perfumes (*C. nardus*), fever, digestive disorders, cosmetics, antiseptics and treatment of fever (*C.flexousus*). Leaves of *C. scheonanthus* are used for the treatment of jaundice, and fever and as an anti-diarrheal agent. The leaves and rhizome of *C. winterianus, C. densiflorus* are employed against asthma, epilepsy, abdominal cramps and pains. Cymbopogon species are also employed in the cosmetic industry (*C. flexuosus and C. jwarancusa* are used for condiments and medicinal purposes). The decoctions of leaves and flowers of *C. giganteus* and *C. citratus* are used against cough and hypertension. Much research has been done and Cymbopogon has very promising outcomes in traditional uses as well as medicinal uses. Several drugs can be developed that would have vast therapeutic potential with almost no or minimal side effects.

Keywords*: Cymbopogon, Lemongrass oils, Pharmacological properties, Phytochemicals, Herbal drugs.*

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The Antioxidant Potential of Medicinal Herbs: An update

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Abstract: Herbs are defined as portions of plants that are used for their aromatic properties and have very limited nutritional value. However, in recent years, it has become apparent that herbs are sources of various phytochemicals, many of which are capable of acting as powerful antioxidants. The present abstract intended to outline the antioxidant properties of medicinal herbs. Plants produce significant amounts of antioxidants in order to prevent oxidative stress caused by photons and oxygen, and therefore may be considered as a potential source of new antioxidant compounds. The Indian healthcare system is heavily reliant on traditional herbal medicines. The use of herbs such as *Amaranthus paniculatus, Aerva lanata*, *Coccinia indica* and *Coriandrum sativum* suggested that they could serve as dietary antioxidant sources, which is an emerging area of research. Antioxidants play an important role in preventing wear and tear on cells. It is believed that antioxidants have a beneficial effect on ageing, support the health of the brain, maintain capillary integrity as well as maintain a healthy cardiovascular system.

Keywords*: Antioxidant, Medicinal herbs, Phytochemicals, Medicinal properties, Ageing, Brain.*

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Scientific Study Based on Plant Species as CNS Stimulant

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Abstract: CNS stimulants increase mental alertness and reduce fatigue. Using herbal medicines worldwide have provided India with an excellent opportunity to identify therapeutic lead compounds. A variety of stimulants affect the central nervous system, including caffeine, cocaine, and amphetamines. The present abstract intended to outline study based on plant species as CNS stimulants. This abstract focuses on the CNS stimulant activity of *Ginkgo biloba, Bacopa monnieri, Aswagandha, Acacia Catechu, Acacia nilotica, Neem, Curcumin, Cucurbita maxima, Barleria prionitis Linn., Alpinia galanga* and *Diplazium esculentum*. Pharmacologically, CNS stimulants can be classified as psychostimulants, psychoanaleptics, or cognition enhancers. The central nervous system is stimulated by psychostimulants such as tea, coffee, and cocoa. The use of cognitive enhancers such as Ginkgo and Gotu Kola can improve memory and also treat vertigo, short-term memory loss, and lack of concentration. In the article, novel approaches are also discussed for formulating herbal CNS stimulants and plants. Research is underway on novel CNS stimulant approaches and targets. Drugs should be delivered in a carrier that minimizes their toxicity and increases their pharmacological activity. Some innovative drug delivery systems must be developed for herbal drugs with enormous therapeutic potential.

Keywords*: CNS stimulant, Herbal drugs, Psycho-analeptics, Medicinal plants, Cognition enhancers.*

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Mandate Study on Hepatoprotective Herbs

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Abstract: Hepatoprotectants are substances that prevent or delay liver damage. Hepatic disorders affect liver cells, tissues, and functions, including detoxification, protein synthesis, and biochemical digestion. According to the World Health Organization, approximately 80% of the global population uses herbal medicines for their basic healthcare needs. Thus, herbal remedies are becoming increasingly popular around the world because of their easy availability and ease of formulation for the treatment of hepatotoxicity. The present study demonstrates that plant extracts with hepatoprotective properties are useful for fighting toxic chemicals that cause liver injury. Future studies on these plants could provide new alternatives to the limited treatment options currently available for liver diseases and their symptoms. Herbs are currently used in conventional medicine to support daily life needs. In the present review, bioactive molecules from plant extracts may be suitable key compounds for the development of effective medications. The healthcare system incorporates various traditional systems including Ayurveda, Unani, and Siddha. Additionally, 40-50 million rural Indians still rely on these systems for healthcare. As a result, traditional systems emphasize hepatotoxicity significantly on amass scale.

Keywords*: Hepatoprotectants, Herbal products, Hepatotoxicity, Phytoconstituents, Liver injury.*

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Traditional Medicines for the Management of Diabetes

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Abstract: Diabetes, the most common endocrine disorder, affected 16 million Americans and 200 million people worldwide. Due to the drawbacks and limitations of synthetic drugs, the use of herbal remedies is gaining more importance. In comparison to synthetic antidiabetic drugs, herbal medicines have a better anti-diabetic effect because of their easy availability, affordability, and fewer side effects. Due to poverty and lack of access to modern medicine, 65-80% of the world's population relies primarily on plants for their primary health care. The information was collected from various scientific databases like PubMed, and Science Direct. Medical plants have been studied extensively for their ability to treat diabetes, as well as having natural therapeutic properties against various diseases. Medicinal plants demonstrate antidiabetic activity due to the presence of phenolic compounds, flavonoids, terpenoids, coumarins, and other constituents which showed a significant reduction in blood glucose levels. Throughout history, medicinal plants have played an important role in treating and preventing a wide range of diseases. There has been scientific evidence that the herbs discussed above have been effective in treating diabetes. Even so, patients with severe conditions continue to require insulin injections, while oral formulations can be substituted with these herbs for those receiving insulin injections.

Keywords*: Diabetes mellitus, Herbal remedies, Anti-diabetic drugs, Traditional medicines, Secondary metabolites.*

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Liquisolid Technology: Recent Advancement and Application in the Development of Pharmaceutical Product

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Abstract: Solving the solubility problems is a major challenge for the development of a new pharmaceutical. Despite introducing different techniques solubility enhancement still remain one of the major reasons for product failure in the early development stage. Various techniques used for the enhancement of solubility of poorly soluble drugs are solid dispersion, liquisolid technique, micronization, nanonization, use of surfactants, etc. The liquisolid technique is one of the prominent technologies for solubility enhancement and dissolution improvement of BCS Class-II and Class-IV drugs which in turn increases bioavailability. This technique is based upon reducing the contact angle and improvement of wettability by reducing the particle size via micronization. The liquisolid technique is based upon utilizing a non-volatile liquid vehicle into a free-flowing, non-advent, and readily compressible dry powder formed by the physical mixing of excipients. This technique is used successfully for the solubility enhancement of drugs like bromhexine, rosuvastatin, hydrochlorthizide, ketoconazole, glipizide, etc.

Keywords*: Poor solubility, Liquisolid, Bioavailability, Non-volatile, Technique, Solubility enhancement.*

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Formulation and Evaluation of Liquorice and Lemon Grass Lozenges

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Abstract: Throat problems are mainly caused by bacterial or viral infections and are marked by discomfort which lasts for a long time. Herbal products provide quick and prolonged relief with a considerably safe profile. Lozenges are sweetened solid dosage forms which are to be kept in the mouth for local relief. Herbal lozenges are better than chemically prepared lozenges as they are having minimum side effects. The main objective of herbal lozenges is to eliminate side effects produced by the use of drugs of chemical origin. It is very easy to prepare with less cost and fewer ingredients. The main ingredients are liquorice and lemongrass. *Cymbopogan citratus* is the common name of lemongrass which is used to treat a variety of drug-resistant bacteria its main constituent of lemon grass is neral, citral, and geranyl acetate. Liquorice is a common name for *Glycyrrhiza glabra* and is the best home remedy to treat sore throat and other upper respiratory disorders due to glycyrrhizin. Other ingredients include basil, ginger, honey, lemon juice, and sugar. We have to heat the ingredients and mould them for their preparation. Its evaluation test includes weight variation which was found to be 10.29, disintegration test was found to be 8 minutes 9 seconds, the thickness was found to be 0.70, antimicrobial test and organoleptic properties. These lozenges were stable have a promising effect.

Keywords*: Glycyrrhiza glabra, Cymbopogon citratus, Liquorice, Lemon grass, Herbal, Anti-microbial activity.*

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Development of Floating Pellets using the Compression/Spheronization Method

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Abstract: Gastroretentive research is based on a polymer matrix technology for extended IH release. The itopride hydrochloride (IH) floating pellets were developed by compression method with spheronization. Pellet's formulation depends on the combination of Eudragit s100 (ES100), and ethylcellulose (EC) along with carbopol P934 (CP934) and sodium bicarbonate. The floating formulation worked on the principle of gas generation; the properties of sodium bicarbonate matrixed with other excipients. In-vitro release kinetics was studied in simulated gastric fluid (pH 1.2) and in-vivo IH performance was evaluated via plasma concentration prolongation due to floating and mucoadhesion of pellets. An increase in ES100 quantity with a decrease in EC quantity improves the cumulative release of IH (99.10%, P14) in 12h with a floating time of 9.4 h. the ex-vivo mucoadhesion shows for 6h. adhesion to goat cheek membrane. IH pellets (P14) were orally given to overnight fasted three rabbits showing extended-release behaviour in a controlled manner of the drug. The findings revealed that mixed polymers are an effective matrix method for controlling itopride hydrochloride release.

Keywords*: Compression pelletization, Spheronization, Floating pellets, Controlled-release, Itopride hydrochloride.*

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P-126

Quercetin-Based Nanoformulation for Cancer Treatment

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Abstract: Natural products have been extensively researched for their potential as antitumor agents due to their incredible chemical diversity. Through numerous studies, quercetin, a polyphenolic flavonoid has emerged as a standout among natural products. Quercetin has a variety of biological attributes, such as anti-inflammatory, anticancer and antioxidant properties. Quercetin must be used in new ways, either alone or in combination with other anticancer medications, using low and pharmacological doses because the effectiveness of the polyphenolic compounds has been limited by a number of side effects. This review article focuses on the potential of nanotechnology drug-delivery systems including polymeric nanoparticles (NPs), silver NPs, polymeric micelles, co-encapsulation, lipid carriers, chitosan-loaded NPs and liposomes. The purpose of this study is to provide a thorough and critical assessment of the anticancer potential of various quercetin nanoformulation for enhanced treatment of various cancers. There was unambiguous proof that quercetin therapy and anticancer activity were related. Studies also revealed that nanoformulations of quercetin have more anticancer activity than either drug alone, increasing the effectiveness of treating cancer. The outcomes of this thorough review show that the nanoformulation of quercetin has anticancer properties. In order to fully realize the potential of quercetin-based nano-formulation for cancer treatment, this work also makes a contribution to ongoing research by addressing present constraints and problems and recommending more research.

Keywords*: Cancer, Natural products, Quercetin, Nanotechnology, Nanoformulation, Anti-cancer activity.*

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Evaluation of the Renoprotective Potential of Antihistaminic Drug Mepyramine in STZ-Induced Diabetic Nephropathy in Rats

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Abstract: Histamine is a pleiotropic amine, historically implicated in several immune-inflammatory processes. Increased number of tubulointerstitial mast cells and their degranulation consequent to diabetic nephropathy progression are suggestive of a direct contribution by histamine to renal inflammation and fibrosis. Mepyramine (pyrilamine) is a first-generation H_1-antihistamine. It reduces the activity of the NF-κB immune response transcription factor through the phospholipase C and the phosphatidylinositol signalling pathways. It also decreases antigen presentation and the expression of pro-inflammatory cytokines, cell adhesion molecules, and chemotactic factors. The aim of the present study was to evaluate the renoprotective potential of mepyramine in STZ-induced diabetic nephropathy. A single injection of streptozotocin at a dose of 55 mg/kg, was used to induce diabetes. Mepyramine was used at a dose of 10 and 20 mg/kg. A number of biochemical tests were done. The level of antioxidant enzymes and renal histopathology was also carried out. There was significant prevention of renal damage in the groups treated with 20 mg/kg mepyramine. This was confirmed by various biochemical tests, antioxidant assays and histopathology. Thus, mepyramine which is an antihistaminic drug significantly prevented renal damage due to hyperglycemia. Mepyramine could be useful as a future drug to prevent kidney damage in diabetic patients with long-standing hyperglycemia.

Keywords*: Mepyramine, Diabetic nephropathy, Antihistaminic, Renoprotective, Antioxidant activity.*

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An Observational Study in CABG Patients

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Abstract: The coronary artery bypass graft surgery (CABG) is used for coronary revascularization. This study observed various type blockage and grafts used to revascularized that blocked coronary artery. An observation perspective study performed during the period of Geetanjali Cardiac Centre, Geetanjali Medical College & Hospital, Geetanjali University, Udaipur between 1 Feb 2019 and 21 Nov 2021 were recruited in this study. Descriptive analysis was performed. Total 123 patients were enrolled in this study with average age of 60.96 Years (SD = 8.46). Out of 123 patients, 106 were male and 17 were female. Patients were admitted with maximum 113 (91.9%) had triple vessel disease (TVD), followed 07 (5.7%) had double vessel disease (DVD), and 03 (2.4%) had single vessel disease (SVD). Maximum patients 88 (71.5%) used (left internal mammary artery + saphenous vein graft) graft for revascularization procedure. Maximum patients 45(36.6%) admitted with co-morbidity were type 2 diabetes.

Keywords*: Coronary artery, Revascularization, Observational study, Coronary artery bypass graft surgery, CABG.*

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Phosphodiesterase 7: An Emerging Target for Treatment of Inflammatory Disorders

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Abstract: Phosphodiesterases (PDEs) are a large family of metallophosphohydrolase enzymes that ubiquitously metabolize the second messengers adenosine and guanosine 3′,5′-cyclic monophosphates (cAMP and cGMP) to their respective inactive 5′-monophosphates. cAMP and cGMP are synthesized by adenylyl and guanylyl cyclases respectively, and mediate the action of hormones, neurotransmitters, and other cellular effectors in many physiologic processes. As elevation of intracellular cAMP level impacts immunosuppressive and anti-inflammatory properties, selective inhibitors of cAMP-specific PDEs have been widely studied as therapeutics for the treatment of human diseases, predominantly immune disorders such as multiple sclerosis and inflammatory processes, and also disorders of the central nervous system (CNS) such as depression, psychosis, and Alzheimer's disease. To date, most of the research has been centered on PDE4 inhibitors because PDE4 represents the major isoenzyme in most T-cell preparations and its selective inhibitors are able to decrease inflammatory cytokine production. However, a major drawback of these compounds is the significant side effects such as emesis. An alternative approach is to target other cAMP-specific PDE families that are expressed in pro-inflammatory and immune cells. Initial evidence indicated that PDE7 had an important role in the activation of T-cells. The latest scientific findings concerning PDE7 and PDE4 inhibition suggest that selective small-molecule inhibitors of both enzymes could provide a novel approach to treat a variety of inflammatory as well as immunological diseases. This review article will discuss role of PDE7 in inflammatory disorders and recent advances in the development of selective small molecule PDE7 inhibitors.

Keywords*: Phosphodiesterase, PDE7, Inflammatory disorders, Immunological disorders, PDE7 inhibitors.*

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Role of Thiazolidine-2,4-dione Analogues in Treatment of Various Physiological Disorders

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Abstract: Thiazolidine-2,4-dione (TZD), also known as glitazones, is a 5-membered heterocyclic ring containing sulphur and nitrogen at 1- and 3- position and two carbonyl groups at 2- and 4- positions respectively. Therefore, TZD can only be substituted at the 3rd and 5th positions of the TZD. TZD is found to possess different biological potentials such as in the treatment of various metabolic conditions by PPAR-γ transactivation, antimicrobial action by inhibiting cytoplasmic Mur ligases, and antioxidant action by scavenging reactive oxygen species. It is widely used as an antihyperglycemic agent to improve insulin resistance. The unsaturated compounds comparatively exhibit a better reduction in plasma glucose and triglycerides levels than saturated compounds and Z- isomer is found to be better than the E-isomer for the reduction in plasma glucose levels. TZD heads derived from an acidic group possess more potent activity than the benzylated TZD. Various drugs such as Pioglitazone, Rosiglitazone and lobeglitazone are available in the market having TZD as the potential group. Various analogues of TZDs have been analyzed/developed using various computational approaches in order to save time for laborious reactions. TZD analogues have been found to be potent against various microbial strains. This study summarizes different analogues of thiazolidine-2,4-dione reported recently which exhibit potent action against various physiological disorders such as antihyperglycemic, antihyperlipidemic, antimicrobial, antioxidant, anti-inflammatory, analgesic, wound healing, anti-proliferative, anti-malarial, antitubercular, antiviral, and antifungal.

Keywords*: Thiazolidine-2,4-dione, Antioxidant, Anti-inflammatory, Antihyperlipidemic Anti-microbial, Anti-hyperglycemic.*

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Biological Potential of 2-Amino Benzothiazole Derivatives: A Review

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Abstract: 2-Amino benzothiazoles are an important class of N-heterocyclic compounds which have a wide existence in medical, agricultural chemicals, bioactive natural products and organic optoelectronic materials. In recent years heterocyclic compounds have attracted strong interest due to their useful biological and pharmacological properties. 2-Amino benzothiazole can be synthesized by the reaction between 2-bromophenyl iso thiocyanate and different amines. Multitudinous approaches have been developed for accessing these compounds including the intramolecular cyclization of arylthiourea through O-H functionalization or C-S bond formation. The intramolecular cyclization of 2-haloaryl thiourea through dehydrogenative C-S bond formation and intramolecular C-N cross-coupling of benzothiazole with amine, 2-amino benzothiazole with an aryl halide. 2-Amino benzothiazole derivatives have been found to be a biologically active antitumor, particularly in breast cancer, antimicrobial, anti-anthelmintic, anticonvulsant, anti-leishmanial and anti-inflammatory activity. The benzothiazoles are endowed with a wide spectrum of activity against *Bacilli* and *Staphylococci*, including penicillin-resistant ones. Benzothiazole-based derivatives have emerged as potent inhibitors of enzymes such as EGFR, VGFR, PI3K, topoisomerase and thymidylate kinase. Some of the drugs such as valditinib, imatinib and gefitinib have benzothiazole nuclei that interact with these receptors. The current review compiles very recent reports on amino benzothiazole derivatives and their biological potential.

Keywords*: 2-Aminobenzothiazole, Biological activities, Topoisomerase, Thymidylate kinase, EGFR, VGFR, PI3K.*

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Antidiabetic Activity of *Aloe vera*

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Abstract: Diabetes is a chronic metabolic disease that may lead to very grave complications. Diabetes could be a chronic (long-lasting) health condition that affects your body that turns food into energy. The body breaks down most of the food into glucose. once your glucose goes up, it signals your duct gland to unharness internal secretion. internal secretion acts sort of a key to let the glucose into your body's cells to be used as energy. The body does not make enough insulin or may be resist to production which leads to diabetes. Herbal drugs are more preferred because of their low toxicity and side effects as compared to allopathic drugs. Traditional medicines derived from herbs measure employed by concerning the world's population. It should, be concluded that *Aloe vera* provides a great impact on treatment of the diabetes mellitus. The mucilaginous tissue at the center of the aloe plant, known as *Aloe vera* gel, is used to make cosmetic and therapeutic goods. *Aloe vera* is a Liliaceae plant that is widely spread in tropical areas. According to reports, *Aloe vera* gel and the phytosterols it contains have the ability to manage blood sugar levels over the long term, making them effective for the management of type 2 diabetes mellitus. *Aloe vera* gel and juice have been able to lower blood glucose level.

Keywords*: Hypoglycemic, Herbs, Insulin, Phytosterols, Phytochemicals, Aloe vera gel, Aloe vera juices.*

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Histamine and Autocoids and their Role in Immunity

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Abstract: Autocoids are diverse substances produced by a wide variety of cells in the body having intense biological activity, these molecules often operate locally, such as in inflammatory pockets or at the site of synthesis and release. These substances play a role in a variety of physiological and pathological processes, particularly the immune system's response to injury and they can even act as transmitters or modulators in the nervous system, though the precise nature of their function at many different sites is unknown. Histamine is one of the helpful autocoids, which acts by altering the activity or metabolism of other molecules including serotonin, bradykinin, prostaglandins, thromboxanes, and leukotrienes. Histamine, also known as beta-aminoethyl-imidazole, is a basic amine that is released when C3a and C5a bind with certain membrane receptors or when an antigen interacts with cell-fixed immunoglobulin E. It is retained in the granules of mast cells and basophils. Immediate hypersensitivity (type 1) and allergic reactions are mostly mediated by histamine. Through the activation of intracellular pathways that cause the synthesis of inflammatory mediators and cytokines in various immune cells by this, it impacts immune system inflammation. Other clinical diseases like psoriasis, a multifactorial skin inflammation caused by Th1/Th17, may be regulated by it.

Keywords*: Autocoids, Histamine, Hypersensitivity, Allergic Reactions, Antihistaminic agents, Inflammation.*

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Role of NSAIDS in Rheumatoid Arthritis

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Abstract: Rheumatoid arthritis (RA) is a chronic, inflammatory, systemic autoimmune disorder which means that the immune system attacks healthy cells in the body by mistake, causing inflammation in the affected parts of the body. Characterized by symmetric inflammation of synovial joints leading to the progressive erosion of cartilage and bone RA mainly attacks the joints usually many joints at once. RA commonly affects joints in the hands, wrists, and knees. In a joint with RA, the lining of the joint becomes inflamed, causing damage to joint tissue. This tissue damage can cause long-lasting or chronic pain, unsteadiness and deformity. Nonsteroidal anti-inflammatory drugs (NSAIDs) are members of a therapeutic drug class, which reduces pain, decreases inflammation, decreases fever and prevents blood clots. NSAIDs work by inhibiting the activity of cyclooxygenase enzymes (COX-1 and COX-2 isoenzymes). In cells, these enzymes are involved in the synthesis of key biological mediators, namely prostaglandins, which are involved in inflammation, and thromboxanes, which are involved in blood clotting. The most prominent NSAIDs are aspirin, ibuprofen, diclofenac and naproxen; all are available over the counter in most countries. Side effects depend on the specific drug, its dose, and duration of use but largely include an increased risk of gastrointestinal ulcers and bleeds, heart attack and kidney disease.

Keywords*: NSAIDs, Inflammation, COX 1, COX 2, Rheumatoid arthritis, Autoimmune disorders.*

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Role of Omega-3 Fatty Acids in Heart Disease Prevention

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Abstract: Angina, sometimes called angina pectoris, is chest pressure or pain that is often brought on by inadequate blood supply to the heart muscle. It most frequently occurs as a sign of coronary artery disease. A blockage or spasm of the arteries that feed blood to the heart muscle is frequently the cause of angina. Even the discomfort from angina might resemble dyspepsia. It is not a disease, but a sign of a cardiac condition that is already present, often coronary heart disease, also known as coronary artery disease. There are several varieties of angina, including stable, unstable, microvascular, and angina brought on by a coronary artery spasm (vasospastic or variant). Omega-3 fatty acids found in fish and fish oil supplements have been proven to be a successful method of heart disease prevention. They can help reduce inflammation and blood clotting, raise HDL cholesterol, lower triglyceride levels, and maintain the health of blood vessels. The first double bond in the group of polyunsaturated fatty acids known as omega-3 occurs on the third carbon in the chain counting from the methyl end of the chain. Due to their ability to block myocyte voltage-gated sodium channels and lengthen the relative refractory time, omega-3 fatty acids may have a direct impact on heart rate.

Keywords*: Angina pectoris, myocardial infarction, Myocardial ischemia, Omega-3 fatty acids, Mechanism.*

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Cardiovascular Effects of COVID-19 Infection and Immunization

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Abstract: Coronavirus disease 2019 (COVID-19) infections and the COVID-19 vaccine both have been associated with adverse cardiovascular effects. Myocarditis, pericarditis, and cardiac arrest (CA) have been reported especially in young adults under the age of 40. Based on a number of studies that provide evidence, outcomes are evaluated by using PubMed/MEDLINE. According to a study performed in Israel, following immunization, the risk of myocarditis was 2.7/100,000 whereas the risk of myocarditis with COVID-19 infection was 11/100,000. In UK-based research, it was observed that the risk of myocarditis is around 16 million-1 after the first dose and 10 million-1 after the second dose. Another study found that among 498,814 recipients of the mRNA vaccine in Denmark, 21 myocarditis cases occurred within 28 days after the inoculation. Researchers found that there were 86,754 deaths from cardiac arrhythmia, 114 deaths from myocarditis, and 356 deaths from pericarditis between 28 days of immunization in a survey of 38,615,491 vaccine recipients in England. A thorough literature search revealed that both patients with COVID-19 and those who received the immunization have experienced cardiac issues. The advantages of protection against COVID-19 disease greatly outweigh the hazards, notwithstanding the minor risk of vaccine-induced myocarditis. The probability of a direct cardiac infection from SARS-CoV-2 has to be proved.

Keywords: *Covid-19, Myocarditis, Pericarditis, Cardiac arrest, Immunization, Covid-19 vaccine.*

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Treatment of Diabetes Mellitus by Medicinal Plants

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Abstract: Diabetes mellitus is a chronic non-communicable disease that causes high blood sugar (glucose) levels. Diabetes is a long-term condition of the metabolism of carbohydrates, fats, and proteins marked by elevated fasting and postprandial blood sugar levels. A complex metabolic condition known as diabetes mellitus is caused by either inadequate or dysfunctional insulin. Because there are insufficient beta cells, type 1 diabetes (insulin-dependent) is brought on by inadequate insulin production. In contrast to type 1 diabetes patients, who are insulin-independent and can be managed with dietary modifications, exercise, and medication, people with this condition are completely dependent on exogenous sources of insulin. Medicinal plants are being researched for the treatment of diabetes; numerous conventional medications have been developed from model compounds found in therapeutic plants. An effective oral glucose-lowering medication is metformin. The usage of *Galega officinalis* to treat diabetes served as the foundation for its development. The hypoglycaemic ingredient, guanidine, is abundant in *Galega officinalis*. Numerous medicinal plants with known antidiabetic properties and other positive benefits are listed, as well as herbal medications used to treat diabetes. These include *Withania somnifera, Tinospora cordifolia, Trigonella foenum graecum, Momordica charantia, Eugenia jambolana, Phyllanthus amarus, Momordica charantia, Pterocarpus marsupium, and Allium sativum.* In addition to having possible advantages, traditional medicines also have potential drawbacks. The majority of traditional medicines were made from inexpensive, widely accessible plant items.

Keywords: *Diabetes mellitus, Insulin-dependent, Type 1 diabetes, Traditional medicines, Herbs, Metabolic conditions.*

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Wound Healing Potential of Herbal Plants

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Abstract: Wound healing is a complex process supported by various cellular events in the human body. The wound is defined as damage or disruption to the normal anatomical structure and function. This can range from a simple break in the epithelial integrity of the skin or it can be deeper, extending into subcutaneous tissue with damage to other structures such as tendons, muscles, vessels, nerves, parenchymal organs and even bone. Wound healing involves multiple cell populations, the extracellular matrix and the action of soluble mediators such as growth factors and cytokines. Wound healing is a continuous process and it may be divided into four phases, i.e., hemostasis, inflammation, proliferation and remodeling. In the past, many allopathic medicines were successfully used to stop microbial growth in wounds. Now many herbal plant parts are used in the treatment of wound healing. Various studies have shown that the wound healing effect of the herbal plant is very effective and when plants of varying potencies are combined then they can produce significant results in comparison to individual use of the plant and produce synergistic effects. The great efficiency of polyherbal formulations in curing a number of diseases is the main reason for their increasing popularity.

Keywords: *Wound healing, Hemostasis, Polyherbal formulations, Inflammation, Synergistic effect.*

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Polyherbal Formulation: New Approach in Herbal Formulations

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Abstract: Ayurveda is one of the traditional medicinal systems of Indian. The philosophy behind Ayurveda is preventing unnecessary suffering and living a long healthy life. Ayurveda involves the use of natural elements to eliminate the root cause of the disease by restoring balance, at the same time create a healthy life-style to prevent the recurrence of imbalance. Herbals are known to regulate bodily functions, cleanse and nourish human body. The Ayurvedic literature *Sarangdhar Samhita* highlighted the concept of polyherbalism to achieve greater therapeutic efficacy. The active phytochemical constituents of individual plants are insufficient to achieve the desirable therapeutic effects. When combining the multiple herbs in a particular ratio, it will give a better therapeutic effect and reduce the toxicity. When the active constituents have similar therapeutic activity, the synergic clinically efficacy targeted by diverse mechanism of action. There are some evidences reported that polyherbal creams are confers with the antioxidant, antiaging, anticancer, antihistamine, anti-inflammatory activity, improved skin care activity, etc., proven with in-vitro and in-vivo methods. The potency of well formulated and tested two or more herbal extract combination shows the greater synergic effects than the individual candidates of plant extract. The problems of polyherbal formulation occur due to sources and manufacturing process, drug-herb interaction, clinical reproducibility, toxicity due to improper manufacturing and irrational prescribing of polyherbal formulation as well as law and regulations. Inspite of all these problems, popularity of polyherbal formulation is increasing and hence it demands more scientific search in this field.

Keywords: *Ayurveda, Polyherbal formulation, Synergic, Polyherbalism, Herbal products, Law and regulations.*

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3-Hydroxy-2-Naphthoic Acid Derivatives and their Biological Potential

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Abstract: Hydroxy naphthoic acids are industrial compounds used in pharmaceuticals, agrochemicals, polymers, dyes, and electronics. It is an aromatic carboxylic acid with one or more hydroxyl groups substituting the naphthalene backbone. 3-Hydroxy-2-naphthoic acid, the abundant and universal dyes intermediates based on naphthalene. 3-Hydroxy-2-naphthoic acid is a constitutional compound with the formula $C_{10}H_6(OH)(CO_2H)$. It's a popular azo dye and pigment precursor. It is produced while CO_2 and the 2-naphthol dried sodium salt undergo the Kolbe-Schmitt reaction at 220 to 260 °C. Antimicrobials are anticipated as one of the leading descriptions of chemotherapy in medical history. The effective treatment of bacterial infections with antibiotics is a consequential advancement in contemporary medicine, but bacteria have evolved resistance to antimicrobial medications throughout time. Therefore, there is need for development of newer compounds which can tackle the microorganisms effectively. The 3-hydroxy-2-naphthoic acid derivatives have been found to possess antibacterial, antifungal, antidiabetic, anti-inflammatory, anti-oxidant, antitumor, antiviral, genotoxicity, and antitubercular activities. This review is focussed to compile the current research reports available on 3-hydroxy-2-naphthoic acid derivatives and their biological activities.

Keywords: *3-Hydroxy-naphthoic acids, Analogues, Antibacterial, Antifungal, Antidiabetic, Anti-tubercular, Synthesis.*

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Need of Optimized Time-Dependent Drug Delivery System for Treatment of Gastric Acid Diseases

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Abstract: Now days managing gastrointestinal disorders is the primary care of physicians. There are increases the gastroesophageal reflux disease (GERD) patients mainly in North America and East Asia. For the management of these GERD and other gastric acids, related disease proton pump inhibitors (PPIs) are the most used in the last three decades. The mechanism of acid suppression by using PPIs which block the gastric H, K-ATPase, inhibiting gastric acid secretion and it produces enables the healing of peptic ulcers, GERD, Barrett's Esophagus, and Zollinger-Ellison syndrome, as well as the eradication of *Helicobacter pylori*. During night time if the patient administered the dose then it gets disappears after some time and the 20% new synthesized proton pump release the gastric acid because they are not inhibited by PPI due to the short half-life of the drug. To inhibit this newly synthesized proton pump next dose of the drug is required but at night time it does not show patient compliance. So, if the newly synthesized drug produces the acid, then may the chances of gastric reflux and disturbance of sleep in the early morning. Hence developing a drug delivery system which can deliver the required amount of drug after single-dose administration is very important.

Keywords: *Gastrointestinal disorders, Helicobacter pylori, Proton pump, Proton pump inhibitor.*

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Diabetes Management: A Nutraceutical Approach using Green Tea and Herbs

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Abstract: Nowadays, half of the world's population suffers from diabetes. Due to a high number of consultations and prolonged hospital stays, diabetic mellitus poses a significant danger to both human health and the world's economies. Tea along with many herbs includes a lot of polyphenols and caffeine, both of which show antidiabetic properties. As a result, researchers are paying more attention to creating antidiabetic drugs using herbs. After water, tea is the beverage that people consume the most globally. Green tea contains a lot of catechins, particularly (-)-epigallocatechin-3-gallate (EGCG), which gives it most of its biological effects. This review discusses the use of herbs like lemon grass, honey and ashwagandha to improve issues related to hyperglycaemia as well as the usage of herbs like cinnamon, hibiscus and ginger in green tea to treat diabetes. Following a thorough review of the scientific literature, it is concluded that hibiscus is a promising product that can be used to treat diabetes. Overall findings suggest that green tea and ginger extracts may have a significant hypoglycaemic effect. According to studies, herbs like Ashwagandha, which has neuroprotective effects when combined with green tea, can be used to improve complications associated with hyperglycaemia like dyslipidaemia, cardiovascular diseases, and nephropathy. Honey also has anti-inflammatory and antioxidant properties. Lemon grass is used as an anti-hyperlipidemic and anxiety reliever. Literature reveals a number of benefits of green tea in the management of diabetes however more research is to be carried out in future in terms of clinical efficacy.

Keywords: *Diabetes mellitus, Green tea, Hyperlipidemia, Cinnamon, EGCG, Catechins, Herbs, Honey, Lemon grass.*

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Benzamide Derivatives as Allosteric Glucokinase Activators: Recent Developments

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Abstract: The majority of persons who have diabetes have type 2 diabetes, which is a chronic illness of the food-metabolism system characterized by decreased insulin action and shown clinically as hyperglycemia. Type 2 diabetes accounts for around 90 per cent of all cases of diabetes. Though several different oral antidiabetic drugs may be used in the treatment of T2D, none of them has shown to be very helpful in getting most people with T2D back into a state where their plasma sugar stays within a normal physiological range. Glucokinase, also known as GK, is a cytoplasmic enzyme that is mostly found in the beta cells of the pancreas and the hepatocytes of the liver. It is responsible for accelerating the conversion of glucose to glucose-6-phosphate with the assistance of adenosine triphosphate (ATP). Previous research has shown that the majority of drug discovery and development research associated with allosteric activators of human GK has primarily focused on substituted benzamide analogues. This is likely due to the fact that these analogues have corresponding alignment outlines and bonding connections with the residues of the allosteric location of GK. Several GK activators, such as AZD6370, AZD1656, MK-0941, Piragliatin, and AMG151, have advanced into the phase II of clinical trials. Despite the significant reduction in blood sugar that was observed, potential adverse reactions such as hypoglycemia and elevated levels of triglycerides were also reported.

Keywords: *Diabetes mellitus, Glucokinase, GK activators, Allosteric, Benzamide derivatives, Clinical trials.*

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Drug Utilisation Pattern Evaluation and Comparison of Cariprazine and Risperidone in Psychosis Patients in Southern Rajasthan

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Abstract: Psychosis is a condition that affects the mind, where there has been some loss of contact with reality. It includes delusions, hallucinations or disordered thoughts. Prevalence of psychosis was found to be 3.89 per thousand patients per year in India. In psychopharmacology, antipsychotic drug research is constantly expanding and new drugs are coming in market that increases the burden on psychiatrist for rational use of drugs. Cariprazine is used to treat certain mental/mood disorders such as bipolar disorder, depression, schizophrenia. It is an atypical/ 2nd generation antipsychotic, which is effective due to its combination of partial agonist activity at central D2 and serotonin 5HT1A receptors. On the other hand, risperidone is also an atypical/2nd generation antipsychotic used to treat schizophrenia, bipolar disorder, irritability associated with autistic disorder. It has high affinity for serotonin type 2 (5-HT2) receptors; binds to dopamine D2 receptors with 20 times lower affinity than that for 5-HT2. The principal aim of this drug utilization pattern evaluation is to facilitate the rational use of the drugs. Cariprazine is a newly approved drug in India (July, 2021); due to lack of studies in this direction, this comparative study will be helpful for practicing clinicians for better patient care. Total 36 participants were enrolled, 15 male, 21 female, with mean age 41.92 years. 21 participants were diagnosed with schizophrenia, 1 with ATPD, 13 with F29 and 1 with delusional disorder. Prescribed drugs per encounter were found to be 2.39. Maximum number of drugs prescribed to the participants were antipsychotics, then Pantoprazole and lastly multivitamin supplements. Out of all the antipsychotics, risperidone, cariprazine and lorazepam were prescribed to maximum number of participants. No significant difference was observed in the efficacy of cariprazine and risperidone in treatment of all the three types of symptoms– positive, negative and general symptoms.

Keywords: *Psychosis, Cariprazine, Antipsychotics, Risperidone, Southern Rajasthan, Drug utilization.*

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An Overview on Phytochemistry and Pharmacology of *Ocimum sanctum* Linn.

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Abstract: From ancient times, *Ocimum sanctum* L. commonly known as holy basil or tulsi is considered one of the core pillars of the traditional practice of herbal medicine. Translationally major portions of the tulsi-based formulations are intended for cold and cough for their strong antimicrobial and anti-inflammatory activity. The present abstract is intended for phytochemistry, molecular pharmacology, clinical and translational outfit of *Ocimum sanctum* L. An extensive literature survey was carried out through various scientific search engines such as PubMed, Google scholar, Science Direct, Medline, Embase, Cochrane library and Indian medical databases. *Ocimum sanctum* L. a benevolent herb has been integrated into traditional medicine. The phytochemical analysis signifies polyphenols and flavonoids as the major essential components present in the tulsi extract and responsible for different pharmacological activities. Diversified phenolic and flavonoid phytoconstituents of tulsi are responsible for its biological activities. Further, the therapeutic potency of tulsi reflects in clinical trial reports provides satisfactory results with negligible adverse effects, which might emerge as a green medicine to lessen the global burden of microbial, inflammation, metabolic associated disorders, etc. However, alteration in the composition and variation in the percentage yield of secondary metabolites due to phenotypic and genotypic disparity are critical challenges that need to address in future.

Keywords: *Ocimum sanctum L., Phytochemistry, Pharmacology, Clinical trials, Holy basil, Tulsi.*

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Phytosomes as Anticancer

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Abstract: Natural substances are receiving a lot of attention these days as effective anti-cancer medications because they have few unwanted side effects. Nanotechnology has mostly been used to improve the efficacy and lessen the side effects of traditional chemotherapy drugs. According to research, pyrosomes significantly increased the bioavailability, increased effectiveness, and decreased the toxic consequences of a variety of phytoconstituents found in plants. Phytosomes are complex chemical compounds derived from plants and have been utilized as anticancer, anti-inflammatory and in eye and skin disorders since ancient times. Phytosomes are small cell-like structures. A lipid surrounds and binds the bioactive phytoconstituents of the herb extract in this sophisticated form of herbal preparation. Phytosomes exhibit better absorption than traditional herbal extract dosage forms, which results in improved bioavailability and effects. Past studies revealed that phytosomes exhibit better pharmacokinetic and pharmacodynamics profiles than conventional herbal extracts in the treatment of cancer. The purpose of this study is to provide a thorough and critical assessment of the anticancer potential of phytosomes in various types of cancer. There was unambiguous proof that the nanophytosomes have better anticancer activity than the other drug delivery systems. Past studies showed that phytosomes increase the effectiveness of drugs in the treatment of cancer. This article aims to provide a succinct overview of phytosomes as a delivery method for cancer treatment. Hydrophilic flavonoids and other related chemicals have improved bioavailability thanks to innovative formulations called phytosomes. They differ from other conventional formulas in many notable ways. This comprehensive review's findings demonstrate that nanophytosomes have superior pharmacokinetic and therapeutic profiles to those of traditional herbal extracts, and it also examines the state of phytosomal research today and possible uses for it in the treatment of various cancers.

Keywords: *Phytosomes, Cancer, Nanotechnology, Anticancer activity, Nanoformulations, Herbal extract.*

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Lifestyle: The Genesis of Malady

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Abstract: Lifestyle diseases are ailments that are primarily based on the day-to-day habits of people. Over the past three decades, cases of Lifestyle-related diseases like heart disease, stroke, obesity, type 2 diabetes, hypertension, metabolic syndrome, chronic kidney failure, osteoporosis, depression, etc. appear to increase in frequency as countries become more industrialized. Till the 1980s, particularly in India, society was majorly agrarian, People employed in white-collar jobs were very few. Hence, all the lifestyle illnesses came with rapid economic growth in these previous years. Today, India has 77 million diabetes patients. The cases related to cardiovascular diseases in India have risen from 2.26 million in 1990 to 4.77 million in 2020. The combination of four healthy lifestyle factors maintaining a healthy weight, exercising regularly, following a healthy diet, and not smoking has an 80% reduction in the risk of developing lifestyle disorder. Ayurveda also offers various procedures to manage lifestyle disorders such as Dincharya, Ritucharya, Panchakarma and Yoga provides enough scope to prevent the disease from the root and promote health. Yoga is an ancient Indian practice that connects the body, mind, and soul through controlled breathing, body postures and meditation. If an individual undergoes different detoxification process regularly, and taking other preventive measures, he never falls prey to lifestyle diseases. All causes of lifestyle disease can be prevented through giving up smoking, alcohol, processed meats, fatty foods and by engaging in daily exercise.

Keywords: *Lifestyle disorders, Ayurveda, Exercise, Healthy habits, Yoga, Malady, Day-to-day habits.*

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A Review on *Aloe vera*

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Abstract: For thousands of years, people have utilised *Aloe vera*, a cactus-like plant in the Asphodelaceae (Liliaceae) family, for traditional medical treatments. *Aloe vera* cultivation is becoming very important commercially for cosmetics and pharmaceuticals. In particular, anthraquinones and polysaccharides, alkaloids, tannins, flavonoids, sterols, triterpenes, mucilages and holosides are among its numerous physiologically active constituents. It is used in cosmetic moisturizers and toothpaste as an active ingredient in hundreds of skin lotions, sun blocks and cosmetics, treat wounds, burns, insect stings, ulcers and skin inflammation, anti-inflammatory, antiseptic and antimicrobial, antitumor, skin protection, anti-diabetic, anti-bacterial, anti-viral activities, antioxidants. *Aloe vera* gel helps in activating new hair growth as it increases blood circulation to the scalp. Many marketed formulations of aloe vera are available in form of gels and juice. It is also used as a base material for the production of creams, lotions, soaps, shampoos, facial cleansers and other products. In the pharmaceutical industry, it is used in the production of tablets and capsules. *Aloe vera* improves skin moisture from the texture of roughness, shines, cracks, and scrapes. This article provides a thorough summary of the phytochemistry, and pharmacological properties and traditional uses of *Aloe vera*.

Keywords: *Aloe vera, Herbal formulations, Marketed formulations, Aloe, Pharmacological activity.*

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Effect of Betulinic Acid in Experimental Model of Amyotrophic Lateral Sclerosis in Rats

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Abstract: Amyotrophic lateral sclerosis (ALS) is also called a disease which disrupts the functions of the neurons and that leads to the degeneration progression of the neurons eventually. It involved the dysfunction of upper and lower motor neurons in patients such as muscle spasm, twitching and muscle atrophy, all impairment along with duration lead to paralysis and finally patient die within 3-5 years. Due to the degradation of copper mounting, mutant SOD1 (mSOD1) can cause motor neuron degeneration even when the enzyme is inactive. To investigate the effect of Betulinic acid on the experimental model of ALS with some neurological models. In this research, we compared the neuropathological aspect of 7 different groups of animals with NC to low-dose, high-dose test drugs and standard drugs. Various physical (body wt., morris water maze, rota rod) and biochemical (MDA, SOD1, TNFα, GABA) parameters were used for evaluation. The progression of neuron destruction in the disease control group in comparison to the test group (TG) was very high. According to biochemical estimation, MDA, SOD, TNF-α, GABA and glutamate levels were shown a significant effect in TG comparison to DC. The effect of BA in an experimental model of ALS has been investigated in rats and results were shown satisfactory responses. The results of this study, BA have a neuroprotective potential that is indicated by biochemical estimation and some physical parameters.

Keywords: *Amyotrophic lateral sclerosis, ALS, Neurological disorder, MeHg, TDP43, SOD1, Inflammation.*

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Advancement in Treatment Strategies for Hemophilia

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Abstract: Haemophilia A and B are rare inherited bleeding disorders specified by the deficiency of coagulation factor VIII (FVIII) or factor IX (FIX). On the bases of degree FVIII deficiency mild, moderate, or severe forms are recognized. The challenges and issues in infants, children and adults are different. Bleeding acts as a symptomatic sign in children; however, the sites of bleeding vary with age. Other symptoms and indicators include nosebleeds with no apparent cause, excessive bleeding from cuts or bruises and unexplained irritability in infants. The main current problem in haemophilia is the infused coagulation factor is inactivated by the alloantibody, although immune tolerance regimens are based on long-term daily injections of large dosages of coagulation factors that can remove inhibitors in approximately two-thirds of affected patients. Prophylaxis is rising as the choicest preventive care strategy and nowadays inhibitors and ICH are some of the challenging complications. Additionally, the therapy for this problem has been significantly improved by the availability of medicines that circumvent intrinsic coagulation abnormalities. The main issues with current treatment plans, like the requirement for repeated intravenous injections and the short half-life of haemophilia medicines, drive current efforts to create coagulation factors with longer bioavailability. The single treatment option for haemophilia is gene transfer therapy, which is the subject of extensive investigation. This review summarizes the pathophysiology, clinical presentation, diagnosis, and treatment of haemophilia as well as information regarding neutralizing antibodies, immune tolerance induction, novel agent, and gene therapy.

Keywords: *Haemophilia, Symptoms, Gene therapy, Inhibitors, Treatments, Pathophysiology, Prophylaxis.*

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Ingredients Used to Prepare Formulation for Thrombocytopenia

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Abstract: Thrombocytes, commonly known as platelets, are cells that work by forming blood clots and help to stop bleeding. Thrombocytopenia is a condition marked by a low level of thrombocytes in blood, i.e., <150,000/microliter of circulating blood. Thrombocytopenia might be triggered due to many potential causes such as various autoimmune diseases, bacteremia, side effects of many medications, viral infections like HIV, dengue, exposure to chemotherapy and aplastic anaemia. The study aims to select ingredients used to prepare formulation for Thrombocytopenia which includes *Carica papaya* leaf extract, wheat grass, lemon and giloy. Papaya (*Carica papaya*) leaves extract has a unique phytoconstituent known as acetogenin which can boost platelet count, especially in a person suffering from dengue by increasing ALOX12 (arachidonate-12-lipoxygenase) enzyme which in turn increases the production of platelets. Wheat grasss can increase the production of blood components from bone marrow including platelets which is due to the presence of a large amount of chlorophyll. Scientifically giloy (*Tinospora cordifolia*) contains many compounds like lignan, alkaloids, terpenoids and steroids which gives giloy its properties like antiviral, antibacterial, anti-inflammatory, for pain, and increasing platelet count, etc.; hence used for the treatment of many disorders. Vitamin C works by improving platelet count and boosting immunity. Lemon is a rich source of vitamin C and it also increases the effectiveness of wheatgrass and prevents damage of platelets by free radicals. Maricha acts as an enhancer and reduces the therapeutic dose for the principal drug and thus reducing the possibilities of toxicity and side effects of a drug. So giloy, papaya leaf extract, lemon and wheatgrass together contribute to the formation of formulation for thrombocytopenia and maricha decreases the associated side effects.

Keywords: *Thrombocytes, Platelets, Carica papaya, Thrombocytopenia, Herbal products, Formulation.*

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Phytochemical Screening of Ocimum sanctum

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Abstract: Plants have been used for medicinal purposes long before prehistoric period. The predominant cause of global morbidity and mortality is lifestyle-related chronic diseases, many of which can be addressed through Ayurveda with its focus on healthy lifestyle practices and regular consumption of adapt-genic herbs. Of all the herbs used within Ayurveda, holy basil tulsi (*Ocimum sanctum* Linn) is preeminent, and scientific research is now confirming its beneficial effects. There is mounting evidence that tulsi can address physical, chemical, metabolic and psychological stress through a unique combination of pharmacological actions. The leaves of the plant were collected and grounded into a coarse powder with the help of a suitable grinder. The powdered leaves were extracted with methanol for 2 days and the concentrate was filtered and designated as crude methanolic extract of leaves. The extract was tested for carbohydrates, tannins, gums, saponins, steroids, alkaloids, glycosides, xanthoproteins and terpenoids. From 200 gm of the powder of leaves of *Ocimum sanctum*, 6.35 gm extract was obtained and the percentage yield was found to be 12.7%. The experimental findings from the study showed that the bark extract of *Ocimum sanctum* possesses organic compounds like glycosides, alkaloids, tannins, flavonoids and terpenoids which can show extensive pharmacologic and other activities. *Ocimum sanctum* has been used for thousands of years in Ayurveda due to its diverse healing properties. It is evident from the available literature that leaves of *Ocimum sanctum* are the most widely used part for ethnomedicine. The multiple uses of *Ocimum sanctum* have given it the status of a miracle plant. The present study was conducted to obtain preliminary information on *Ocimum sanctum* including its pharmacognosy and phytochemistry. The study will be further extended to the detailed examination, phytochemical analysis and chromatographic analysis of tulsi leaves and its extract.

Keywords: *Ocimum sanctum, Phytochemistry, Alkaloids, Glycosides, Flavonoids, Extraction, Tulsi.*

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Hydrogels Promote Wound Healing Better than Traditional Bandages/ Gauze

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Abstract: A hydrogel is a three-dimensional matrix of hydrophilic polymers that can swell in water and store a high amount of water while maintaining structural stability due to the chemical or physical cross-linking of individual polymer chains. Hydrogels are used extensively in biomedical applications because of their unique features such as biodegradability, biocompatibility, hydrophilicity, super absorbency and visco-elasticity because of their micro-adhesive and bio-adhesive properties, many hydrogels can extend the time that medications stay on the body, making them good candidates for drug carriers. When used as a wound dressing, hydrogel not only forms a physical barrier and removes excess exudates but also provides a moist environment that promotes the wound-healing process. Additionally, a hydrogel can perfectly fill irregularly shaped wounds and deals with deep bleeding efficiently. Hydrogels are recommended for wounds that range from drug to mild exceeding and can degrade slowly on the wound surface. Hydrogels have a marked cooling and soothing effect on the skin, which is valuable in burns and painful wounds. Hydrogels have an advantage over typical wound dressings in that they may alter their composition according to the wound and its state of feeling. Most of the criteria for modern wound dressings are met by hydrogels: the ability to absorb wound exudates, the ability to maintain a moist environment, the ability to maintain gas exchange, thermal insulation, and ease of removal from the wound surface.

Keywords: *Hydrogel, Wound-healing, Gauze, Bandages, Hydrophilic polymers, Exudates, Wound surface.*

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Trace Elements and Minerals in Aging and Age-Related Diseases

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Abstract: Ageing is an inevitable biological process with gradual and spontaneous biochemical and physiological changes and increased susceptibility to diseases. Ageing is a multifactorial process that gradually deteriorates the physiological functions of various organs, including the brain, musculoskeletal, cardiovascular, metabolic, and immune systems leading to numerous pathological conditions like Alzheimer's disease, Parkinson's disease, and atherosclerosis with high rates of morbidity and mortality. Trace elements are found in small amounts and the count in the body is essential for diverse processes maintaining body functions and health status. All trace elements are toxic if consumed at high levels for long periods. The complex regulation of the trace element homeostasis depends among others, on age, sex, and nutritional status. Several ageing mechanisms have been identified, primarily including genomic stability, telomere shortening, and cellular senescence. Developments highlight the potential of trace elements and minerals application in the diagnosis and treatment of diseases. Trace elements and minerals containing supplements, aggressive nutritional therapy, and rehabilitation are important agents for the treatment of deficiencies. Trace element biomarkers may be used to better understand how trace elements affect metabolic pathways, pinpoint the causes and effects of the major chronic diseases, including genetic factors, trace elements, and other environmental factors, and specify the needs of subgroup populations. This review summarises the role of the following trace elements in the aetiology and prevention of age-related diseases: selenium, copper, iron, zinc, manganese, iodine, and sodium along with vitamin K, iodine, chloride, fluoride, magnesium, and molybdenum with the latest research data.

Keywords: *Trace elements, Ageing, Disease, Minerals, Deficiency, Vitamin K, Age-related diseases.*

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Edible Vaccine: Current Status and Future Prospects

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Abstract: Vaccines are biological preparations that improve immunity to particular diseases. Particularly for poor developing nations, edible vaccines show significant potential as a financially advantageous, simple to administer, simple to store, fail-safe, and socially and culturally acceptable vaccine delivery system. A vaccine is made by the incorporation of the gene-encoding bacterial or viral disease-causing agent in plants without losing its immunogenic property. Potatoes, tomatoes, rice, soybeans, and bananas are the main plants used for edible vaccines. It activates the systemic and mucosal immune responses against a foreign disease-causing organism and offers exciting possibilities to reduce various diseases including hepatitis B, rabies, HIV/AIDS, etc. These vaccines provide a lot of benefits including being convenient to administer, easily storing and readily acceptable drug delivery systems for patients of different age groups. So, an edible vaccine may be the most convenient form of vaccine to improve immunity. But there are a lot of technical and regulatory challenges to overcome in the way of edible vaccine technology. Various technical obstacles, and regulatory and non-scientific challenges, though all seem surmountable, need to be overcome. In this review, we will discuss the various technologies, host plants, current status, future of this new preventive modality and different regulatory issues concerning edible vaccines.

Keywords: *Edible vaccine, Biological products, Transgenic plants, Biotechnology, Immunity, Technology.*

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Pharmacological and Phytochemical Profile of Potential Medicinal Plant, *Celastrus paniculatus* Willd (Jyotishmati)

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Abstract: *Celastrus paniculatus* (CP), commonly known as Jyotishmati is considered as "elixir of life" by Indian people for the prevention or management of many ailments. CP is cultivated in various tropical as well as subtropical areas of India including Punjab, Karnataka, Himachal Pradesh, Arunachal Pradesh and Uttar Pradesh. It is also cultivated in various countries Sri Lanka, Australia, Vietnam, Nepal, Malaysia and China. The seed powder and its extract have been widely used commercially for the preparation of various ayurvedic formulations for the improvement of memory. The seed extract of CP is dispensed in the form of nervine tonic which is used to cure somnolence, headache and melancholia. The phytoconstituents present in seeds of CP consist of various chemical classes such as sesquiterpenes, sesquiterpenes polyalcohols, sesquiterpene polyol ester, sesquiterpene alkaloids, dihydroagraofuran sesquiterpenoid polyester, fatty acids, esters, sterols, fatty acid esters, flavonoids, phenols, mono, di and tri terpenes. CP plant extracts exhibited various pharmacological properties such as cognitive enhancement, antidepressants, antipsychotic, antibacterial, antimalarial, anti-inflammatory, analgesic, wound healing activity, hypolipidemic, anti-cancerous and anti-spasmodic. Thus, the potential pharmacological importance of the herb fetches the attention of industries and a large number of commercial formulations of this plant.

Keywords: *Celastrus paniculatus, Jyotishmati, Elixir of life, Phytochemistry, Pharmacology, Formulations.*

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Gallic Acid: Potential Candidate for Multiple Disorders

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Abstract: The phytochemical gallic acid (3,4,5-trihydroxy benzoic acid) belongs to the class of phenolic acids. Gallic acid is found in many fruits, vegetables and plants in different concentrations. Its sources include food items like berries, bananas, grapes, dates, tea, cauliflower, eggplant, olive, chicory and others. Gallic acid can be isolated from different plant species such as Punica spp., and Quercus spp., through chromatography. In industries, it is produced by hydrolytic breakage of tannic acid using the tannase enzyme. Gallic acid inhibits the growth of cancer cells by modulating genes that encode apoptosis, metastasis, angiogenesis and cell cycle. Hence, gallic acid is a potent, novel drug candidate for the treatment of cancer. When gallic acid is conjugated with peptide RGD, galloyl-RGD is formed and it is found to be a promising candidate as a cosmetic ingredient. Gallic acid showed anti-obesity activity by decreasing leptin and pro-inflammatory markers in serum and was found to decrease weight in mice with food-induced obesity by decreasing lipogenesis. Gallic acid has the potential for the treatment of Alzheimer's disease and Parkinson's disease. Due to its highly lipophilic nature, gallic acid can penetrate the microbial cell wall causing its lysis. Studies showed that gallic acid can fight pathogens like Escherichia coli, Listeria monocytogenes and other foodborne pathogens. Gallic acid also possesses activities like antioxidants and free radical scavenging.

Keywords: *Gallic acid, Anticancer, Anti-obesity, Alzheimer's disease, Parkinson's disease, Antioxidant.*

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Synthesis, Antimicrobial Activity of N'-(Substituted Benzylidene)-2-Chloro-4-Fluorobenzohydrazide Derivatives

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Abstract: A series of hydrazide derivatives were synthesized by the reaction of 2-chloro-4-fluoro benzoic acid with ethanol leading to the formation of ethyl 2-chloro-4- fluorobenzoate. Further, 2-chloro-4-fluorobezohydrazide was synthesized from ethyl 2-chloro-4-fluorobezoate by reacting it with hydrazine hydrate. Further hydrazide derivatives are synthesized by the condensation of the 2-chloro-4-fluorobezohydrazide with different substituted aldehydes. All synthesized derivatives were screened for their antibacterial and antifungal activity. In specific, compound 2-chloro-N'-(4-chlorobenzylidene)-4-fluorobenzohydrazide **(D4),** 2-chloro-N'-(2-chlorobenzylidene)-4-fluorobenzohydrazide **(D11)** were highly active against *E. coli* and 2-chloro-N'-(3-chlorobenzylidene)-4-fluorobenzohydrazide **(D15)** were highly active against *B. subtilis*. The newly synthesized derivatives may be potential antibacterial compounds.

Keywords: *Hydrazone, 2-Chloro-4- fluorobezohydrazide, Synthesis, Antibacterial, B. subtilis, C. albicans, E. coli.*

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Potential Bioscience Implications in the Energy Market

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Abstract: The manufacturing of biofuels has significantly increased recently. Between 2000 and 2007, the amount of biofuel produced globally tripled, and in 2012, biofuels made up 1.6% of the world's transportation fuel. The production of ethanol, which had revenues of $40.9 billion worldwide in 2014 compared to $3.8 billion for biodiesel and $0.019 billion for bio-methane, is by far the largest contribution made by biotechnology to the production of energy. It makes sense to assume that biotechnology will eventually contribute more to global energy production, including biofuel production, petroleum production, petroleum upgrading, biogas production, chemical production, crop improvement, bioremediation, corrosion caused by microorganisms, space travel, and other areas. However, the price of fossil fuels, the development of renewable energy generally, politics, the rise of the world's population, and other factors will also have an impact on the future contributions of biotechnology to the energy business. Reduced oil prices, ever-improving technology for producing and using wind and solar energy, the political will to support/subsidize the development of alternative energy, and worries regarding the usage of crops for food production versus fuel production are further influencing factors.

Keywords: *Biodiesel, Biofuel, Fossil fuels, Energy market, Bioremediation, Sustainability, Bioscience.*

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Emerging Role of Terpenoids for the Treatment of Inflammation and Pain

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Abstract: Natural products have been effective in the treatment of inflammatory conditions for a long time and nowadays. Terpenoids are the greatest class of secondary metabolites that are produced by plants and are rich in monoterpenes, diterpenes, triterpene, tetraterpenes, ceramide, and sesquiterpenes. Various therapeutic applications of terpenes such as antimicrobial, antibacterial, antitumor, and anti-inflammatory activity have been established. Phytochemical constituents present in terpenoids particularly showed anti-inflammatory and analgesic activity. The review describes the different terpenoid-derived compounds isolated from natural sources over the past ten years showing the anti-inflammatory and analgesic potential and their therapeutic mechanism of action. The main purpose of this study is to provide a scientific review of the anti-inflammatory potential of different terpene bioactive compounds for enhancing the treatment of various inflammatory ailments and summarize therapeutic applications regarding the use of terpenoids in various painful conditions. This review elaborates on the potent anti-inflammatory active compounds obtained from terpenoids and gives details to researchers engaged in herbal products and anti-inflammatory drug discovery. The review emphasized on the pharmacological importance of terpenes like monoterpenes, diterpenes, triterpene, and sesquiterpenes and their mechanism of action as emerging anti-inflammatory and analgesic agents.

Keywords: *Analgesic activity, Anti-inflammatory activity, Secondary metabolites, Natural products, Terpenoids.*

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Pharmacological Aspect of *Euphorbia neriifolia*

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Abstract: Plants have always been an asset as being used as medicines for the treatment of various diseases. One such plant is Euphorbia neriifolia with poisonous milky white latex. Due to the existence of secondary metabolites, medicinal plants have a great deal of promise as antibacterial agents. This in-depth review aims to summarise the morphology, ethnobotanical applications and classifications of *Euphorbia neriifolia* Linn and the phytochemical produces an emphasis on bacterial, viral, fungal and parasitic illnesses emphasised in updates on the pharmacological properties against developing infectious disorders. Euphol, nerifoliol, taraxerol, glut-5-(10)-ene-1-one, amonohydroxy triterpene and amyrin are examples of compounds present in this plant. Modern science claims that this plant has immunomodulatory activity, hepatoprotective, antibacterial and wound healing activity analgesic, anti-inflammatory, anti-oxidant activity, diuretic, anti-diabetic, anti-hyperlipidaemic and other activities such as anti-carcinogenic activity and anti-psychotic actions.

Keywords: *Medicinal plants, Euphorbia neriifolia, Phytochemicals, Pharmacological effects, Antibacterial agents.*

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Medicinal Uses of *Ageratum conyzoides*

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Abstract: Annual plant *Ageratum conyzoides* Linn has a long history of usage as a traditional medicine in many nations around the world, particularly in tropical and subtropical areas. *Ageratum conyzoides* Linn commonly known as goat weed belongs to the family Asteraceae. It is extensively distributed throughout the world, particularly in tropical and subtropical regions. *Ageratum conyzoides* is an erect, annual herb that grows to a height of 30 to 80 cm, stems are covered with fine white hairs, leaves are opposite, pubescent with long petioles and include glandular trichomes. Its achene fruit is easily spread by wind and has an aristate pappus. In some countries, the species is considered a weed. This species has provided a wide variety of chemical constituents including alkaloids, flavonoids, chromenes, benzofurans, and terpenoids. This plant's extracts and metabolites have been reported to have pharmacological and insecticidal properties. Major pharmacological activities of the plant, including anti-inflammatory effects, spasmolytic effects, gamma radiation effects, anti-cancer analgesic activity, antibacterial activity, and radical scavenging activity, antimalarial activity among others have been well reported. An effort has been made in the current review to bring out the medicinal uses of *Ageratum conyzoides* Linn.

Keywords: *Ageratum conyzoides, Phytochemistry, Pharmacological effects, Insecticidal activity.*

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Heath Benefits of *Cestrum nocturnum*

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Abstract: Plants have been employed in Ayurveda to cure a variety of ailments. The Ayurvedic Pharmacopeia classifies *Cestrum nocturnum* as an evergreen shrub also known as night-blooming jasmine which is native to tropical and subtropical climates all over the world under the extra-pharmacopeial category. This unusual member of the Solanaceae family blooms at night and gives off a fragrant scent. This shrub grows at an altitude range of 1000-1900 meters in humid and sub-humid climates. The species has been spotted in Panama at elevations above 2500 meters and below 100 meters. It is a prominent ornamental plant with magnificent and fragrant white flowers, it is grown as a medicinal plant and used as a hedge plant. Phenylacetaldehyde has been recognized as one of the volatile compounds present in the flower. The major constituents of *Cestrum nocturnum* are β-phellandrene (12.1%), linalool (11.3%), α-phellandrene (9.2%), and (E)-β-ocimene (9.1%). Some glycosides, including two new flavonol glycosides, seven steroidal saponins, four new ones, and eight new steroidal glycosides have been isolated from the leaves including (25R)-spirost-5-ene-2R,3,-diol pentaglycosides (nocturnoside A), (25R)-spirost-5-en-3,-ol tetraglycoside (nocturnoside B) and phenolic glucosides (cesternosides A and B). Organic extract and oil of *Cestrum nocturnum* shows a broad range of anti-fungal activity against *Botrytis cinerea, Colletotrichum capsici, Fusarium oxysporum, Fusarium solani, Phytophthora capsici, Rhizoctonia solani,* and *Sclerotinia sclerotiorum*. The night-blooming jasmine has a number of health benefits, including antioxidant, larvicidal, hepatoprotective, analgesic, antibacterial, antifungal, anti-convulsant, and anti-HIV qualities. Extracts of *Cestrum nocturnum* can be utilized to treat wounds and stop tumour growth and it is also used to inhibit malignant tumour growth. Burns and epilepsy are two common conditions that *Cestrum nocturnum* is used to treat. In addition to these uses, *Cestrum nocturnum* essential oils are well-known for preventing malaria and serving as insect repellents. The current study covers all of the following topics: geographical distribution, historical history, cultivation, applications, harmful effects, synonyms, botanical description, taxonomical categorization, phytochemical components, and pharmacological activity.

Keywords: *Cestrum nocturnum, Night-blooming jasmine, Phytochemistry, Pharmacological activities.*

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In-Silico Tools as An Alternative to Preclinical Studies

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Abstract: Preclinical studies, also known as animal experimentation, refers to procedures performed on living animals for purposes of research into basic biology and diseases, assessing the effectiveness of the new medicinal product, and testing the human health or environmental safety of the consumer. Most laboratory animals spend most of their lives in small, relatively barren cages. Common laboratory species suffer marked stress, fear, and possibly distress (indicated by the distortion of a broad range of physiological parameters). Therefore, there is a need to change with a global drive towards reducing, refining, or replacing animal tests with nonanimal alternatives. It is generally recognized that no single alternative method will be able to provide a one-to-one replacement for assays based on the more complex toxicological endpoint. Software, barriers to acceptance, new development, and the use of integrated approaches are all discussed. The purpose of this study is to provide a thorough and critical knowledge of animal use and alternatives in preclinical studies. *In silico* studies, *in vitro* assay, high throughput screening, omics and mathematical biology are the alternative methods to reduce animal experimentation. Animal ethics is an important issue as important as human welfare. There are several alternatives for animal experimentation use have been suggested that need to be used in an efficacious manner like computer models, bioinformatics tools, enzymatic screens, cell cultures (*in vitro*) and model organisms are necessary.

Keywords: *Animal studies, Preclinical trials, In silico tools, Bioinformatics tools, Computer models.*

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Review on Study of Nanoparticles

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Abstract: Nanotechnology refers to the creation and utilization of material whose constituent exists at the nanoscale and, by convention, is up to 100 nm in size. Nanotechnology explores electrical, optical, and magnetic activity as well as structural behaviour at the molecular and sub-molecular levels. It has the potential to revolutionize a series of medical and biotechnology tools and procedures so that they are portable, cheaper, safer and easier to administer. Nanoparticles are being used for diverse purposes, from medical treatments used in various branches of industrial production such as solar and oxide fuel batteries for energy storage to wide incorporation into diverse materials of everyday use such as cosmetics or clothes, optical devices, catalytic, bactericidal, electronic, sensor technology and treatment of some cancers due to their exceptional properties including antibacterial activity, high resistance to oxidation and high thermal conductivity. Nanoparticles can be synthesized chemically or biologically. Metallic nanoparticles have immense applications in industries. This study aims to present an overview of nanoparticles, with special reference to their mechanism of biosynthesis and types.

Keywords: *Metallic nanoparticles, Nanotechnology, Sub-molecular, Nanoformulation, Nano-particles.*

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Nano Based Drug Delivery Systems

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Abstract: Nanomedicine and nano-delivery systems are a relatively new but rapidly developing science where materials in the nanoscale range are employed to serve as means of diagnostic tools or to deliver therapeutic agents to specifically targeted sites in a controlled manner. Nanotechnology offers multiple benefits in treating chronic human diseases through site-specific, and target-oriented delivery of precise medicines. Recently, there are a number of outstanding applications of nanomedicine (chemotherapeutic agents, biological agents, immunotherapeutic agents, etc.) in the treatment of various diseases. The current review presents an updated summary of recent advances in the field of nanomedicines and nano-based drug delivery systems through comprehensive scrutiny of the discovery and application of nanomaterials in improving both the efficacy of novel and old drugs (e.g., natural products) and selective diagnosis through disease marker molecules. The opportunities and challenges of nanomedicines in drug delivery from synthetic/natural sources to their clinical applications are also discussed. In addition, we have included information regarding the trends and perspectives in the nanomedicine area.

Keywords: *Nanomedicine, Nanotechnology, Diagnostic tools, Chemotherapeutic agents, Anticancer agents.*

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Solubility Enhancement Techniques: Present Past and Future

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Abstract: Solubility is one of the most important parameters to attain a desired concentration of drugs in the bloodstream for their pharmacological activity. Among new chemical entities (NCEs) identified by pharmaceutical industries, about 40% face numerous difficulties during formulation and development stages because of low solubility and dissolution rate. Mostly these drugs lie under BCS class 2 or class 4, which have low solubility, poor dissolution and low bioavailability. Solubility is a major challenge for formulation scientists. For better absorption, the drug must be present in solution form at the site of absorption. This review article explores the various types of methods to improve the solubility of hydrophobic drugs such as size reduction of drug particles, liquisolid technology complexation, microemulsions, solid dispersion techniques, pro-drugs, uses of surfactants, micelles, polymeric micelles, uses of co-solvents, soft gel technology, nano morph technology, and crystal technology, etc. Among these, liquisolid technology is a novel and promising technique for improving the solubility of poorly water-soluble drugs. This technique involves a preparation where the drug in solution or suspension form is converted into non-adherent, non-sticky, dry and free-flowing powder, which is processed by adding appropriate carrier and coating materials. The main advantages of this technique are that it is cost-effective, can modify drug release patterns, has the capability of industrial production, etc.

Keywords: *New chemical entities, Nanomorph, Micelles, Liquisolid technology, Solubility enhancement.*

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Recent Advancements of Nanotechnology in the Management of Ocular Inflammation

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Abstract: Ocular administration of drugs is one of the most challenging concepts in pharmaceutical profession because of the intricate physiology of the eye. The eye is the most convenient site for a medication's topical administration yet due to its effective defence mechanisms, the main issue with ocular delivery is poor bioavailability of the drugs. One of the most common disorder related to eye is ocular inflammation. The major complexity of the conventional dosage forms is to subdue ocular barriers so there is need of efficacious drug delivery system which nurture the bioavailability and target specification of drugs. Lipids based nanocarriers are biocompatible and enhance efficacy of drugs. Delivery of drugs through nanotechnology-based delivery system manifest desired controlled release with fewer side effects. In order to deliver synthetic and natural anti-inflammatory drugs, lipid nanoparticles have a great potential to be a crucial component of new therapeutics in ophthalmology. Both lipophilic and hydrophilic drugs can be incorporated and administered using nanotechnology. This discussion emphasis on the need of nano medicines to improve the bioavailability and safety margin of the ocular medications.

Keywords: *Nanotechnology, Lipid-based nanocarriers, Anti-inflammatory drugs, Ocular delivery.*

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Evaluation of Anti-Anxiety Potential of Bark Extract of *Cassia fistula* Linn.

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Abstract: Anxiety disorder is one of the most prevalent & disabling classes of psychiatric illnesses. It is an exaggerated feeling of apprehension, uncertainty & fear. It is an unpleasant state of tension with anticipation of imminent danger or fear about some defined or undefined threats. Sensations of anxiety are a part of the human experience, but excessive or inappropriate anxiety can become an illness. *Cassia fistula* Linn (CF) family Caesalpiniaceae has been extensively used in the Ayurvedic system of medicine for treating various ailments. The present study aims to evaluate the anxiolytic potential of *Cassia Fistula* bark. Balb/C mice, weighing 20-30 g were used for the study. Dose levels of Ethyl acetate extracts of *Cassia fistula* bark (EECFB) were standardized based on reduction in locomotors activity and selected as 15.63 mg/kg, 31.25 mg/kg & 62.5 mg/kg b.w., and the data were analysed statistically. The administration of EECFB increases no. of entries & time spent in open arms in the EPM study, increases in no. of squares crossed & head dipping in the Hole-Board test, increases in no. of entries & time spent in the Mirror chamber test, increases in no. of climbing's steps in staircase exploration test, the anxiogenic effects of Yohimbine were also antagonized by CF. The study showed that the administration of EECFB decreases the anxiety effect in experimental mice.

Keywords: *Cassia fistula, Anxiety, Bark, Ethyl acetate extract, EPM, Hole-Board test, Mirror chamber test.*

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Quercetin Dihydrate Ameliorates Triton-Induced Hyperlipidemia in Rats

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Abstract: Alteration in the dietary pattern due to the modernization of societies, high saturated fat intake and sedentary lifestyle are the major causes of hypercholesterolemia, which further lead to the initiation and progression of atherosclerosis and heart attack. Currently available antihyperlipidemic drugs have many side effects so to overcome these side effects, it is essential to use natural plant-based drugs. Quercetin dihydrate is a flavonoid present in a variety of fruits and vegetables such as onions, cranberries, sweet potatoes, broccoli, kale, and *Glycyrrhiza glabra* and has various activities like antioxidant, anti-inflammatory, antitumor and reduce lipid peroxidation. The objective of this study was to evaluate the effect of Quercetin dihydrate on triton-induced hyperlipidemia in rats. Adult Wistar rats of either sex (n=6) were divided into the following groups: Group I: Normal control (Saline), Group II: Triton control (100mg/kg), Group III: Triton + low dose of Quercetin dihydrate (25 mg/kg), Group IV: Triton + a high dose of quercetin dihydrate (50 mg/kg), Group V: Triton + atorvastatin (10 mg/kg) for 28 days and the data were analysed by statistically. The result significantly demonstrated the effect of quercetin dihydrate in triton-induced hyperlipidemic rats. The parameters like- reduced weight gain, lipid profile, liver function, lipid peroxidation, and changes in the aortic lesion were observed after treatment. The finding indicates that quercetin dihydrate was able to lower plasma lipid concentrations, improve oral fat tolerance, and HDL levels and might be beneficial in the treatment of hyperlipidemia and atherosclerosis. It was concluded that quercetin dehydrates showed hypolipidemic activity and additionally have increasing antioxidant levels and overcome the hemodynamic abnormalities.

Keywords: *Quercetin dihydrate, Hyperlipidemia, Flavonoids, Atorvastatin, Antioxidant, Triton-induced.*

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Clinical Research in Herbal Cosmetics

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Abstract: The field of cosmetic dermatology is expanding. Though many double-blind, randomized controlled clinical trials, the mainstay of evidence-based medicine, have been carried out in this field, high-quality basic science studies have been published. Clinical investigation is vital to the discovery of fresh information, strengthening of the scientific foundation, overcoming obstacles, and sound clinical practice. Interest, availability, perseverance, and honesty are some fundamental guidelines for a productive researcher. The public is expecting more efficacy from cosmetics due to the steadily growing trend of functional cosmetics consumption, so in order to meet these consumer needs, various Through technical convergence research, effective raw materials, and products have been activated with a focus on dermatology. Herbs, herbal materials, herbal preparations, and finished herbal products with plant parts, other plant components, or mixtures as active ingredients are examples of traditional herbal remedies. Only after standardization and marker identification are clinical trials for conventional herbal remedies conducted using herbal formulations to guarantee the consistency of the ingredients under evaluation. Analyzing the direct and indirect hazards connected to conventional herbal remedies is crucial. This can only be determined until clinical trials have demonstrated the efficacy and safety of herbal medications. The present study focuses on reported clinical trials of various herbal cosmetics.

Keywords: *Cosmetics, Skincare products, Herbal medicine products, Clinical trials, Clinical protocol.*

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An Epoch of Gene Therapy from Preclinical Research to Clinical Use

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Abstract: Gene treatments that can be used to treat a wide range of human diseases have finally been developed after three decades of promise. Since the gene was discovered to be the fundamental element of heredity, it has been a goal in medicine to be able to precisely alter specific locations in the human genome. Gene therapy is therefore explained as the capacity to alter a person's genetic makeup by correcting changed (mutated) genes or site-specific alterations that are meant to treat a medical disease. This treatment was made possible by advancements in genetics and bioengineering, which enabled the modification of vectors for the transfer of extrachromosomal material to target cells. As examples of regulatory license acceptance and early encouraging clinical research results increase, the appeal of gene therapies is growing. Because payors eventually came to recognize the medical benefits of these treatments, the number of transformative gene therapy clinical trials and approved gene therapy products has considerably increased. The current paper includes an overview of the many types of gene therapy and their delivery methods, gene editing technologies, regulatory concerns, clinical trials, licensed products, ongoing challenges, and future goals.

Keywords: *Gene therapy, Gene delivery, Gene editing, Clinical trials, Preclinical research, Clinical use.*

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Nanostructured Lipid Carrier: An approach to Targeted Drug Delivery System

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Abstract: In recent years with the advent of creating cutting-edge drug delivery systems that address the drawbacks of conventional drug delivery systems, the fields of nanotechnology and nanomedicine have revolutionized the pharmaceutical business. Delivery devices called nanostructured lipid carriers (NLCs) include a core matrix made up of both liquid and solid lipids. It was demonstrated that NLCs had some advantages over conventional carriers for medication therapy, including enhanced permeability, improved bioavailability, fewer side effects, prolonged half-life, and tissue-targeted delivery. Recent years have seen an increase in interest in NLCs. It is emphasized that NLCs may be employed for various administration methods. Being the most popular methods for examining NLCs, parenteral injection and topical distribution are given special consideration. Applications for pharmaceutical and cosmetic products are mentioned as relevant topics for the launch of NLCs on the market. The study discusses recent advancements in NLCs-based medication delivery techniques and methodically explains the structures, preparation methods, and physicochemical characterization of NLCs. The current challenges and anticipated future developments are also outlined.

Keywords: *Nanostructured lipid carriers, NLCs, Targeted drug delivery, Physiochemical characterization, Market access.*

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Antibiotics Resistance Biggest Threat in Future

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Abstract: Antibiotics are the majorly used lifesaving agents, which are facing very series complication. Nowadays bacteria become resistive to these agents, causes worldwide rising number of death due to heavily usage of antibiotics day by day, microbes are very skilled and delicate art of survival. Due to this they can change their genome type or even make their own antibiotics. which are not affect this bacterium. Like group A streptococcus resistive against erythromycin, group B stereptococcus show resistance against clindamycin, mycoplasma genitalium are resistive to azithromycin. Recently published studies showed that 7,00,000 peoples showed antimicrobial resistance per year and another 10 million projected to die from it by 2050. So, it is a non-negotiable process, and antibiotics resistance is very likely to develop due to these reasons it is very indispensable to lay hold an action about this critical situation by inducing alternatives agents to slap this aversion against microorganisms for such a great future for our generations and providing eminent opportunities in research field. In this review article we will discuss important factors which contribute to emergence of drug resistance among patients on antibiotics therapy and also introducing alternatives of antibiotics which have a special type of mechanism of action on germs, so that they cants oppose to our therapies. we have to create an evolution in drug industries for our better future.

Keywords: *Antibiotics, Resistance, New techniques, Alternatives, Evolution, Antimicrobial resistance, AMR.*

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Pernicious Heavy Metals Detection in *Heliotropium indicum* L. and *Mimosa pudica* L. Leaves

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Abstract: Medicinal plants are getting popularity day by day and hence their consumption is also increasing. This increasing commercialization is ultimately leading to the increased use of synthetic fertilizers and as a result heavy metals have entered into the human food chain. In the view of this, World Health Organization (WHO) has made the provision of testing heavy metals to maintain the quality assurance in the herbal formulations. In the light of WHO guidelines, two herbal drugs, i.e., *Heliotropium indicum* L. and *Mimosa pudica* L. were collected from market and tested for heavy metals. In the present research study, the leaves of above-mentioned herbs were studied for the analysis of four heavy metals viz. Lead, Arsenic, Cadmium and Mercury. Heavy metals were found to have values below permissible limits in both the selected herbs.

Keywords: *Heavy metals, Lead, Mercury, Medicinal herbs, Mimosa pudica L., Heliotropium indicum L.*

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Health Problems and Diseases Associated with Diet-Induced Obesity

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Abstract: Obesity is a complex disease involving an excessive amount of body fat a major health issue in industrialized countries. Obesity not only a cosmetic concern but also its a medical problem that increases the risk of other diseases and health problems, for instance heart diseases, diabetes, high blood pressure, and certain cancers. Obesity is often associated with cognitive and mood disorder. There are many causes of obesity, usually results from inheritance, physiological, and environment factors, combined with diet. Diet plays an important role in the pathogenesis of obesity. The biggest risk factor for obesity and its associated comorbidities is western diet. It induces adipose tissue (AT) dysfunction. Since adipose tissue is a vital endocrine organ, its dysfunction damages the other organs, thus including a state of chronic inflammation causing various comorbidities. Obesity is associated with insulin resistance vascular dysfunction altered cortisol metabolism in humans. High fat diet induced obesity, alters the autophagy throughout the body in a tissue. Obesity increases the likelihood of various diseases and conditions which are linked to increased mortality. These includes type 2 diabetes mellitus, cardiovascular diseases, metabolic syndrome, chronic kidney disease, hyperlipidemia, hypertension, non-alcoholic fatty liver disease (NAFLD), obstructive sleep apnea, osteoarthritis, and depression. So, in this article, we discuss about the obesity induced by diet and its role in health problems and diseases.

Keywords: *Obesity, Autophagy, Comorbidity, Endocrine, Hyperlipidemia, Inheritance, Diet-induced.*

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Potential of Solid Dispersions to Enhance Solubility of BCS Class II Drugs

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Abstract: When a weakly water-soluble drug is administered orally, the main issue is oral bioavailability. Solid dispersion (SD) supercritical, technology has been investigated as a method of producing an amorphous carrier to improve the solubility, dissolving rate, and bioavailability of poorly water-soluble medicines. The adoption of an appropriate carrier and approach in the creation of SDs has a considerable impact on their biological behaviour. SDs were created using a variety of pharmaceutically approved polymers and innovative technologies. The purpose of developing formulation solid dispersions is to improve the solubility and oral bioavailability of many drugs that are poorly soluble. To make solid dispersion, various methods are available, including solvent evaporation, melting, melt solvent method, kneading, co-grinding method, co-precipitation method, modified solvent evaporation method, spray drying, gel entrapment technique, and co-precipitation with supercritical fluid. Fourier transform infrared spectroscopy, X-ray diffractometry, scanning electron microscopy, differential scanning calorimetry, solubility and dissolution studies are used to assess solid dispersion. The solid dispersion technology is one of the most slashing methods for addressing the issue of the solubility of drugs that are poorly water-soluble. Therefore, it is essential to research the physiochemical characteristics of the drug and carrier that can work together the best before establishing a novel solid dispersion system for a certain drug.

Keywords: *Solid dispersions, Water-soluble, Bioavailability, Physicochemical, Solubility, BCS class III.*

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Pathophysiology and Treatment of Traumatic Brain Injury

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Abstract: Traumatic brain injury (TBI), particularly in children and young adults, is a leading cause of death and disability globally. It is quite diverse clinically, leading to delayed pathological events causing structural brain damage and a physiological alteration in brain function. TBI can be caused by road accidents, head falls, blasts, and violence. Two types of damage are produced after TBI, i.e., primary and secondary injuries. Primary brain injury is caused by a direct impact on the head which is irreversible and cannot be treated. The primary injury is then followed by a secondary injury, which is reversible in nature and can be treated. It causes biochemical, cellular, and physiological events like blood-brain barrier rupture, oedema formation, excessive intracellular influx of calcium, oxidative stress, an increase in intracranial pressure, excess release of excitatory neurotransmitters, lipid degradation, the initiation of inflammatory responses, mitochondrial dysfunction, necrosis, and apoptosis. The molecular and structural changes lead to functional disabilities, i.e., cognitive disability and motor dysfunction. By understanding the cascade of secondary brain injury, we can find out about the multiple therapeutic approaches. Therefore, the present study has been designed to focus on elaborating the neuropathology and potential treatment for secondary brain injury in TBI.

Keywords: *Traumatic brain injury, Blood-brain-barrier, Excitotoxicity, Neuroinflammation, Oxidative stress.*

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Impact of Genetic Modification by BT in *Solanum tuberosum*

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Abstract: Genetically modified (GM) crops are the type of crops whose DNA has undergone genetic modification in order to insert a new trait in plant that does not occur naturally. Since the 1920s, bacterium called *Bacillus thuringiensis* (BT) has been employed as an insecticide spray and is frequently utilised in organic farming. Since 1996, commercial Bt crops like cotton, potato, and maize have been cultivated. Potato (Solanum Tuberosum) is the third most important crop worldwide. BT gene encodes a poisonous protein known as cry-protein. When an insect eats a crop, BT enter in their gut and gets activated due to its alkaline pH. The GM potato is produced by the introduction of Cry3A delta-endotoxin from BT. Within two days, the cry3A toxin killed all newborn larvae, and within two weeks, 99% of adults died. The widespread use of Bt crops is due to their higher crop yield and decreased demand for chemical insecticides which have a positive impact on the environment. The Recent research indicates that the germplasm of potatoes contains numerous important genes for resistance to numerous illnesses and abiotic stress. In this review, the major focus is on the concept of biotechnology to incorporate insect resistance genes provides certain advantages over conventional breeding and have the ability to quickly adapt to new environments due to changing climate and as per the current literature survey, there is no data related to its limitation except its higher cost.

Keywords: *Genetically modified, Organic farming, Cry protein, Insecticides, Abiotic stress, Insect resistance, Germplasm.*

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Green Tea in Management of Hypercholesterolemia

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Abstract: Green tea derived from *Camellia sinensis* contains catechins as major bioactive constituents, especially epigallocatechin gallate which exerts hypocholesterolemia effects. Hypercholesterolemia is a word for high levels of cholesterol in the blood. 63 % of Indians have high low-density lipoprotein (LDL) cholesterol in their blood. Due to the increasing demand for herbal medicine, researchers are paying more attention to the herbal approach. Studies show that guggul and arjuna when given with green tea produce a synergistic effect by decreasing triglycerides and LDL cholesterol. Various studies revealed that herbs including ashwagandha, peppermint, triphala, and ginseng show a hypocholesterolemic effect in patients. Too much caffeine can cause a jittery and anxious effect. Because green tea contains less caffeine and high antioxidant as compared to other forms of tea namely black tea and oolong tea, it can be used by hypercholesterolemia patients. This review focuses on green tea along with different herbs when consumed by people having hyperlipidemia, showing healing effects by attenuating endothelial induce dysfunction by oxidizing LDL. A study showed that by increasing the production of bile which help in hypercholesterolemia, peppermint can be found helpful. Currently, people are more reliant on herbal products than allopathic products due to their fewer side effects.

Keywords: *Green tea, Epigallocatechin gallate (EGCG), Blood lipid, Ayurvedic supplements, Herbal products.*

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Effect of Different Solvents on Maximum Absorbance of Rivaroxaban

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Abstract: Rivaroxaban, which is sold under the brand name Xarelto, is an anticoagulant medication used to prevent and treat blood clots. More specifically Rivaroxaban is used to treat deep vein thrombosis and pulmonary emboli and prevent blood clots in atrial fibrillation and following hiporknee surgery. Rivaroxaban is taken by mouth. Solvents affect the fine structure of absorption curve as well as the intensities and wavelength of the maxima. This study purposes a method for determining the effect of solvents on absorbance maxima of rivaroxaban with the help of UV-Spectrophotometer. The study was done by mixing rivaroxaban in different solvents namely DMSO, methanol, chloroform, and acetone. Since rivaroxaban was freely soluble in DMSO, methanol and chloroform, the absorbance maxima of 212 nm were recorded with DMSO, 247.50 nm with methanol and 204.50 nm with chloroform. Moreover, absorbance maximum of rivaroxaban was recorded at 222.50 nm in acetone. The proposed method could help research studies with lesser resources available. The results obtained are reproducible and reliable.

Keywords: *Absorbance maxima, Rivaroxaban, Di-methylsulfoxide, Methanol, Chloroform, Acetone.*

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Hepatoprotective and Antioxidant Activity of Silymarin

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Abstract: It has been known since earlier period that medicinal plants are used to treat ailments. Several species, including *Silybum marianum, Phyllanthus niruri,* and *Panus giganteus* have been demonstrated to reduce liver lesions in the case of hepatic disorders. *Silybum marianum* is the scientific name for Milk thistle which is also known as St. Mary's thistle of the Asteraceae family. It contains flavonoids and antioxidants, can help strengthen the body's immune system. The major composition of silymarin is flavonolignans (where silybin is chiefly as 50%, followed by sily chrysanthemum at 20%, silydianin at 10%, and isosilibine at 5%. While Silydianin levels is higher in plant stems and seed compounds. It has strong antioxidant, suppress inflammation (due to TGF-β1 & TNF-α) and potentially conjugate free radicals block free radicals formed by the metabolism of harmful chemicals including ethanol, acetaminophen, and carbon tetrachloride is what gives rise to its hepatoprotective and antioxidant properties. Due to its antioxidant nature, markedly raises blood levels of high-density lipoproteins cholesterol and significantly lowers cholesterol and low-density lipoproteins levels by decreasing cholesterol absorption. Many literatures reveal that, by working on several cellular and molecular pathways, silymarin is used extensively as a neuroprotective, hepatoprotective, cardioprotective, antioxidant, anti-cancer, antidiabetic, anti-viral, anti-hypertensive, immunomodulator, anti-inflammatory, photoprotective, and detoxifying agent.

Keywords: *Silybum marianum, Milk thistle, Hepatoprotective, Lipoperoxidation, TGF-β1, TNF-α, Silymarin.*

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Use of Herbal Plants as Immunomodulators During COVID-19 Pandemic

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Abstract: COVID-19 is a communicable disease that spreads quickly from person to person through respiratory droplets produced when an infected person coughs, sneezes and talks. The novel coronavirus has caused highly adverse health problems worldwide. The worldwide medical research network tried to find his cure for the new Coronavirus infection. In such situations, herbal plants were used to boost immunity in defence against deadly virus. It is believed to be effective against this pandemic and to enhance healthy immunity. Herbal plants play an important role as immune modulators. We know from ancient times and recent experiences that herbal plants are effective against a variety of severe viral illnesses. Many supplements basically form herbal plants may help to improve immune response like, *Curcuma longa, Ocimum Sanctum,* and *Zingiber Officinale*. Herbal medicine can interfere with COVID-19 pathogenesis by inhibiting SARS-CoV-2 replication and entry to host cell. Since these botanical plants having low cost, minimum toxicity and almost found everywhere in country, they have potential to enhance immunity to fight against COVID-19 and other infectious disease.

Keywords: *COVID-19, Medicinal plants, Immunomodulators, Herbal medicines, Immunity, Phytochemicals.*

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Distribution of Candida Species in Various Specimens and Evaluation of Chrom Agar Candida Medium

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Abstract: The aim of the study was to evaluate the distribution of CHROMagar-Candida for the identification of Candida spp. from different clinical specimens. The growth of cultures on plates, containing Sabour and dextrose agar and CHROMagar Candida were compared. Non-Candida albicans yeast isolates were further specificated with API 20C (bioMerieux, France). Of the 178 cultures processed, 100% accuracy for *Candida albicans, Candida krusei, Candida tropicalis* and 99% for the other Candida spp. were determined. CHROMagar-Candida was found to be a satisfactory isolation medium for different clinical specimens, allowing immediate and correct identification of the commonly encountered yeasts. The use of CHROMagar as a yeast isolation medium in a clinical laboratory for the routine examination appears to be extremely successful in primary isolation and differentiation medium in different sample collections (vaginal specimens, blood cultures, gaita, urine sample, sputum and oropharyngeal swabs) of yeast also it is more rapidly than classical methods.

Keywords: *CHROMagar Candida spp., Identification, Candida, Distribution, Agar medium, Cultures.*

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Production of Human Growth Hormone by Recombinant DNA Technology

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Abstract: Growth hormone (GH), also referred to as somatotropin, is a peptide hormone that is produced and secreted by the anterior pituitary gland's somatotrophs. Recombinant DNA technology is a rapidly expanding subject, and scientists from all over the world are creating innovative techniques, tools, and modified goods for use in a variety of fields, including agriculture, health, and the environment. GH's primary function in children is to promote linear development, but it also promotes a healthy body composition by boosting muscle mass and decreasing fat mass. It increases insulin secretion, which decreases the hormone's efficacy and can lead to weariness and ravenous hunger. The human growth hormone gene is typically inserted into E. coli plasmids to create recombinant human growth hormone. In several nations, recombinant human growth hormone (rGH) is therefore authorized for the treatment of low stature in a variety of pediatric diseases. The current study is grounded in actual research. The patients were split into two groups: an ISS group and a GHD group. The study patients' height, weight, and BMI were tracked and evaluated after receiving treatment for a year. However, there was no statistically significant difference between the ISS and GHD groups. Both individuals with ISS and those with GHD can grow taller when taking rHGH for a brief period of time.

Keywords: *Human growth hormone, Recombinant, Innovative, Insulin, rGH, Recombinant DNA.*

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Phyto-Therapeutics to combat Multidrug Resistance via Bacterial Drug Efflux Pumps Inhibition

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Abstract: Antibiotics, formerly regarded as the lifeline for the management of bacterial ailments, are in danger because of the emergence of threatening antimicrobial resistance (AMR). Bacteria with multidrug resistance (MDR) escalates the mortality rates and treatment costs resulting in the most significant present risks to public health. The situation becomes worse because of the lack of new, powerful antibiotics that are particularly effective against multidrug-resistant bacteria. Multidrug efflux pumps (EPs) have been identified as key contributors to AMR because they expel numerous antibiotics from the cell, typically in an unspecific way. As a result, they have become effective drug targets for preventing AMR. Medicinal plants are the source of bioactive chemicals, that can be used to produce powerful EP inhibitors (EPIs). The phytotherapeutics with notable drug-resistance-reversal may prove to be important strategies for revitalizing the otherwise dwindling antibiotics arsenal by enhancing the efficacy of combination therapy. Modern efforts to strengthen antibiotics with pure phyto-molecules and plant extracts have gained speed, however, they have had relatively less success against Gram-negative bacteria. Plant-based EPIs like piperine, baicalein, berberine, palmatine, capsaicin, ursolic acid, etc., have the potential to be effective drug leads in the fight against EPI-mediated AMR. In addition, recent developments in in-silico MDS approaches have enabled medicinal chemists to computationally validate and support the hypothesized mechanisms of EPs and EPIs. As a result, EPIs are being considered a promising adjunctive therapy with known antibiotics to improve their antibacterial potency at low concentrations and reduce the emergence of AMR and virulence. Identification of phyto-EPIs that can head toward clinical phases and ultimately clinical practices may pave the way for future research to combat AMR.

Keywords: *Antibiotics, Antimicrobial resistance, Multidrug resistance, Phytochemical, Efflux pump inhibitors.*

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Advancement in Drug Development and Discovery Using Machine Learning

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Abstract: Drug development and discovery have been boosted by developments in computational science. Both the business world and the academic world increasingly depend on artificial intelligence. Data production and analytics are just two areas where machine learning, a crucial element of artificial intelligence, and deep learning, a crucial element of machine learning, have been incorporated. To improve the effectiveness, efficiency, and quality of created outputs, machine learning and deep learning algorithms are now frequently used in the approaches for developing therapeutic targets and discovering novel drugs. There have been significant advances in a number of academic and industrial fields, including speech recognition, image classification, bioinformatics, etc., thanks to machine learning methods, particularly deep learning techniques that allow for multiple layers of representation of data with multiple levels of abstraction. SVMs are supervised machine-learning methods for simplifying compound classification, ranking, and regression-based property value prediction. SVMs are frequently employed for binary property or activity predictions, such as to differentiate between medicines and non-drugs or between compounds that have or do not have specific activity, synthetic accessibility, or aqueous solubility. Machine learning and deep learning algorithms used in drug development and related methods will be covered in this review applications that deliver promising outcomes and techniques will also be examined.

Keywords: *Machine learning, Artificial intelligence, Drug development, Drug discovery, AI, Efflux pump inhibitors.*

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Novel Multiparticulates Technology

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Abstract: Controlled release formulations in tablet form are many but over the years the spheroids/multiparticulates or pellet formulations have gained immense popularity owing to their superiority over the former in several respects: controlled absorption with resulting reduction in peak to trough ratios, targeted release of the drug to specific areas within the gastrointestinal tract, absorption of drug irrespective of the feeding state, minimal potential for dose dumping, facility to produce combination of dosage form, etc. Spherical oral dosage forms such as pills have been used in the pharmaceutical industry for a long time, but the full impact of systematically agglomerated spherical units or pellets on controlled release oral dosage form design and performance was not realized till early 1970s.These solid oral dosage form consists of a multiplicity of small discrete particulates, which include pellet and granules. These systems provide flexibility during formulation development and therapeutic benefits to patients in last two decades. The significant advantage of multiparticulates is that they can be divided into desired doses without formulation or process changes. Furthermore, controlled-release multiple-unit dosage forms are less susceptible to dose dumping than the reservoir or matrix type, single unit tablet since the drug release profile does not depend on the drug release properties of a single unit. Technological advances in dosage form design, the advent of highly specialized equipments, and the popularity of controlled–release dosage forms as a means of drug delivery have made multiparticulates a viable and attractive alternative to single dosage forms. Multiparticulates (pellets) also have numerous therapeutic advantages over single unit's dosage forms. When taken orally, multiparticulates generally disperse freely in the gastrointestinal tract, maximize absorption, minimize side effects, and reduce inter-and intra-patient variability.

Keywords: *Spheroids, Multiparticulate system, Pellet formulations, Therapeutic applications, Technology.*

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Decoding Therapeutic Applications of Quercetin and Recent Advancements in Nanotechnological Strategies

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Abstract: For centuries, people have used herbal medicine to treat a variety of health problems and as a natural substance, they have a favourable effect on our health. Herbal ingredients can be utilized as lead molecules in the innovation and development of a new drug. Flavonoids are a class of organic compounds with varying phenolic structures that are present in fruits, vegetables, cereals, bark, roots, stems, flowers, tea, and wine. Flavonoids are mainly divided into seven major groups. The most prevalent polyphenolic bioflavonoid or flavonoid is quercetin (3,3',4',5,7-pentahydroxyflavanone), which is classified as flavonols and is present in foods including yellow onion, curly kale, leeks, cherry tomato, broccoli, apple, green and black tea, black grapes, and blueberry. Quercetin has demonstrated a wide range of pharmacological activity, including the treatment of allergy, metabolic, and inflammatory illnesses, ocular, cardiovascular diseases and arthritis. Quercetin has attracted interest as an interesting pharmacophore with the potential to significantly advance research and the development of novel therapeutic medicines for a variety of diseases. Despite having a huge therapeutic potential, these flavonoids have unfavourable pharmacokinetic characteristics, along with their low BA and poor solubility which limit their use in therapeutics. And meanwhile, the objective of the current study is to present new updates on major therapeutic uses of quercetin and other types of nanocarriers that contain quercetin to treat various ailments and nanotechnology has been suggested as a potential treatment for these problems.

Keywords: *Quercetin, Nanotechnology, Therapeutic applications, Flavones, Herbal products Flavonoids.*

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Treatment of Cancer Using Nanoparticles

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Abstract: Enabled by their size and supramolecular structures, nanoparticles (that is, particles of approximately 10 to 100 nanometers) promise to be particularly capable agents in the detection, diagnosis, and treatment of cancer. When loaded with chemotherapeutic agents, nanoparticle delivery to cancerous tissues relative to healthy tissues may be favourably biased by size and through the attachment of targeting ligands to the surface of the particle. Nanoparticle synthesis using microorganisms and plants by green synthesis technology is biologically safe, cost-effective, and environment-friendly. Plants and microorganisms have established the power to devour and accumulate inorganic metal ions from their neighbouring niche. Nanotechnology in conjunction with biology gives rise to an advanced area of nanobiotechnology that involves living entities of both prokaryotic and eukaryotic origin, such as algae, cyanobacteria, actinomycetes, bacteria, viruses, yeasts, fungi, and plants. Therefore, biological entities or their extracts are used for the green synthesis of metallic nanoparticles through the bio-reduction of metallic particles leading to the synthesis of nanoparticles. Nanoparticles (size in the nanometer range) provide a new mode of cancer drug delivery functioning as a carrier for entry through fenestrations in tumour vasculature allowing direct cell access. This results in the delivery of high drug concentrations to the targeted cancer cell, with reduced toxicity of normal tissue. Several such engineered drugs are in clinical practice, including liposomal doxorubicin and albumin conjugate paclitaxel. The carrier-mediated paclitaxel has already shown significant efficacy in taxane-resistant cancers, an approach highly relevant in prostate cancer, where taxanes are the treatment of choice.

Keywords: *Nanoparticles, Nanotechnology, Nanobiotechnology, Taxane, Cancer, Anticancer agents.*

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Potentials of Cytisine for Nixing Nicotine Cravings: An Alkaloid from Golden Rain Tree

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Abstract: Cytisine is a naturally occurring chemical also known as sophorine or baphitoxine that has been shown in recent research to be useful for smoking cessation. It is commonly used in European nations as a low-cost alternative to nicotine therapies. According to WHO (World Health Organization) 6 million of people die annually from tobacco related diseases are from developing countries. According to the sources, cytisine exhibits nicotine-like characteristics. This is because the chemical has been demonstrated to successfully replicate Nicotine's activity in the body. Current smoking cessation drugs, such as nicotine replacement therapy (NRT), bupropion, nortriptyline, or varenicline, have been demonstrated in clinical trials to be successful but are underutilized by smokers seeking to stop due to side effects, contraindications, low acceptance and high cost. Smokers want good assistance to increase their chances of quitting smoking. Cytisine has been shown in clinical research to be effective and safe as a smoking quitting agent. Hence, cytisine appears attractive to those people who prefer not to use a nicotine-based product or antidepressants to help them quit smoking.

Keywords: *Cytisine, Alkaloids, Nicotine cravings, Sophorine, Baphitoxine, Smoking quitting agent.*

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Current Herbal-Based Medicine for the Treatment of Osteoarthritis

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Abstract: Arthritis is a widespread health problem that affects millions of people. The two major types are osteoarthritis (OA) and rheumatoid arthritis. OA is an inflammatory disease that is influenced by a variety of variables including mechanical and oxidative stress, injury, ageing, obesity and metabolic disease. Degeneration of joint cartilage, alterations in the underlying bone, and synovitis are all symptoms of OA. However, many allopathic medicines are available for the treatment of OA, but herbal-based therapy has a significant role in the treatment of the disease with minimal side effects and more therapeutic uses. As allopathic medicines have side effects like gastric irritation, allergic reactions, swelling, hepatotoxicity and cardiovascular disease therefore it becomes necessary to treat disease with herbal medicines. Moreover, herbal medicines have minimal side effects and also have additional benefits like antioxidant properties. Many phytoconstituents present in herbal medicines like flavonoids and polyphenols have anti-inflammatory effects. Herbal medicines and other natural resource-derived chemicals, such as nutraceuticals represent a growing sector in OA therapy. According to laboratory research, extracts from the Devil's claw root can block many processes that induce joint inflammation. Although animal research revealed that this chemical alone cannot explain its painkilling properties. Ginger, like other plants, is a complex collection of chemicals in terms of pharmacology. Gingerol, beta-carotene, capsaicin, caffeic acid and curcumin are among the hundreds of identified compounds of *Zingiber officinale*. Ginger has been demonstrated to be a dual inhibitor of both COX and lipo-oxygenase to suppress leukotriene production.

Keywords: *Inflammatory disorder, Osteoarthritis, Rheumatoid arthritis, Devil's claw, Ginger extract, Zingiber officinale.*

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Advance Drug Delivery System for Targeting Carcinomas

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Abstract: Cancer vaccine delivery is a multidisciplinary scientific field that is currently undergoing rapid development. An important component of cancer vaccines is the development of novel vaccine delivery strategies such as colloidal immunostimulatory delivery systems, through immunotherapy, and gene therapy-based treatment. The importance of formulation strategies for cancer vaccines can be explained by the poor immunogenicity of tumour antigens. For instance, the colloidal vaccine delivery system modifies the kinetics, body distribution, uptake and release of the vaccine. This explores recent research that is directed towards more targeted treatments of cancer through a colloidal vaccine delivery system. Furthermore, carrier systems like polymeric, micro and nanoparticles, liposomes, archaeal lipid liposomes, immune-stimulant complexes and virus-like particles are also utilized. Also, a variety of drug delivery system platforms have been developed that enable more efficient uptake into lymphatic vessels and lymph nodes to provide targeted modulation of the immune response to cancer. However, cancer vaccines typically suffer from a series of biopharmaceutical challenges due to poor solubility, low systemic availability and lack of targeting availability. Owing to these challenges physicians and pharmaceutical scientists have explored the applications of nanocarriers as quite promising systems for effective treatment against tumours. Cancer vaccines are promising tools in the hands of the clinical researcher oncologist. Many tumours associated antigens are excellent targets for immunotherapy and vaccine design. Optimally designed cancer vaccines should combine the best tumour antigens with the most effective immuno-therapy agents as well as delivery strategies to achieve better therapeutic achievements. Besides nanoparticles have obtained more and more attention in the development of vaccine delivery platforms. Moreover, nano particles-based vaccine delivery platform has a high potential for improving the immune-gene city of the vaccine.

Keywords: *Cancer, Advance drug delivery system, Vaccines, Nanoparticles, Nanotechnology, Anticancer.*

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Role of Anti-Microbial Agents in Human Health Care

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Abstract: In recent years, scientists working in pharmaceutical companies have become increasingly interested in antimicrobial peptides for their therapeutic potential. These molecules are low molecular weight proteins with a broad range of antimicrobial and immunomodulatory properties. The inability of microbes to develop resistance to most of these antimicrobial peptides has made them an effective product that is able to significantly impact the new era of antimicrobials. As a result, pharmaceutical companies are conducting appropriate clinical trials to develop these peptides as potential therapeutic drugs. More than 60 peptide products have already been approved for hundreds and more in preclinical or clinical development. Using rational design existing peptides can further be modified in terms of their chemical and physical properties. This mini-review discusses sources, mechanisms and recent therapeutic applications of antimicrobial peptides.

Keywords: *Antimicrobial drugs, Antibiotic resistance, Clinical trials, Immuno-modulatory activities.*

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Comprehensive Review on Clinical Trials for Colon Cancer: Targeted HER2

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Abstract: Colorectal cancer (CRC) is the fourth commonest cause of cancer death. It is estimated that 151,030 new cases of colon cancer have been diagnosed with a death rate of 3.8 of which 25% of patients have metastatic disease at diagnosis and most of the patients develop metastatic disease. Regardless of many advances in the treatment of metastatic CRC the rate of survival is still low. The treatment criterion for CRC has changed a lot over the past decade with a lot of targeted approaches. Some metastatic CRC cases overexpress the HER2 (Human epidermal growth factor receptor 2) oncogene which plays a crucial role in tumour progression and cell proliferation. Presently this receptor is being utilized in targeting therapies. The monoclonal antibodies and HER2 are receptor-specific tyrosine kinase inhibitors, as well as antibody-drug conjugates, which deliver targeted cytotoxic drugs, making it possible to effectively treat HER2 amplification in CRC today. There are not any particular guidelines for HER2 therapies. However, the HERACLES-A, My Pathway, Destiny-CRC02 and some other non-government studies have shown benefits in a small number of patients with the use of combination trastuzumab-lapatinib and trastuzumab-pertuzumab, respectively. This review comprises the current data on the application of anti-HER2 therapy and future outlooks for HER2 targeting in mCRC including the ongoing clinical trials targeting the HER2 pathway cycle in metastatic CRC and therapeutic approaches in regimen criterion of colon cancer.

Keywords: *Colon cancer, Colorectal cancer, Metastatic Colon cancer, HER2, Targeted Therapy.*

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Efflux Pump Inhibition: A Novel Target to Overcome Drug Resistance

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Abstract: Bacterial infections were anticipated worldwide due to developed mutated microbial strains. This results in the development of drug resistance. Available formulations or antibiotics were now found to be less effective in today's era. So, there is time to perceive new targets which will help to overcome drug resistance. Literature explores our selection to combat resistance by inhibition of efflux pumps. Efflux pumps are specialized transporter proteins. Efflux pump inhibitors (EPIs), block these pumps and thus have been suggested as potential molecules that could revive the activity of antibiotics against bacterial infections. EPIs may be natural as well as from synthetic sources. A combination of antibiotics with natural or synthetic components (EPIs) may also be found to be helpful in potentiating the effect of the antibiotic, e.g., ciprofloxacin with piperine. Therefore, drugs that inhibit efflux pumps are appealing for reversing/ combating multidrug resistance and preventing the emergence of resistance in therapeutically important bacterial pathogens. So, the efflux pump was recognized as a new novel target to combat drug resistance; which when inhibited; reduces the level of resistance or potentiates or produces a synergistic effect in combination with antibiotics. Keeping this in view, the present review article aims to describe the families of efflux pumps and the various natural and synthetic components to be employed as good efflux pump inhibitors.

Keywords: *Antibiotics, Antimicrobial resistance, Multidrug resistance, Efflux pump, Efflux pump inhibitors.*

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Hypertension in Developing Countries: A Major Challenge for the Future

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Abstract: Hypertension is one of the major risk factors for the occurrence of death from cardiovascular diseases having numerous deformities. According to WHO/ ISH hypertension is defined as a systolic blood pressure of 140 mmHg or greater and/or a diastolic blood pressure of 90 mmHg or greater. The development of primary hypertension condition is because of abnormally high blood volume in the body and it develops gradually develops over a long time or years. The major risk factors associated with hypertension include a family history of hypertension, ethnicity, high salt intake, 35 years of age and old, stress, obesity, insulin resistance, low physical activity, more consumption of alcohol, smoking, and the process of ageing. The occurrence of secondary hypertension is found to be near around 5-6% of all hypertensive cases. Hypertension is one of the very serious risk factors and is responsible for different heart diseases and strokes. It is one of the leading and primary reason for heart mortality. In the USA approximately 30% of adult death is because of hypertension. In 2007-2010, the high blood pressure occurs between the grown-up population aged ≥18 was 27% while the age-adjusted incidence of hypertension control was 48%. Individuals who are between 65 and older are among those with the highest rate of hypertension (72%).

Keywords: *Hypertension, Risk factors, Blood pressure, Stroke, Cardiovascular disorders, Deaths.*

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An Insight on Ulcer Protective Potential of Herbal Drugs

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Abstract: The peptic ulcer has been considered as one of the major disorders of the gastrointestinal tract, which is characterized by discontinuation in the inner lining of the tract and sloughing of inflamed dead tissue. Various pathogenic mechanisms have been reported to cause the formation of ulcer that involves the disturbance of normal equilibrium as a result of increased aggressive factors like acid and pepsin and decreased mucosal resistance offered by protective factors like bicarbonate, prostaglandin, nitric oxide and growth factors. In addition, regular usage of drugs, irregular food habits and stress have been documented in the development and progression of peptic ulcers. Standard treatment of peptic ulcers includes drugs like proton pump inhibitors, antibiotics, anticholinergics, and histamine receptor antagonists that offers effectiveness against peptic ulcer disease. However, these drugs have been shown to possess potential side effects, limited efficacy and drug interactions, that affect their effectiveness in the treatment of peptic ulcers. Hence, the need for more effective and less toxic alternatives is warranted, which is fulfilled by herbal drugs which have shown significant potential in the treatment of peptic ulcers. Various plants have been reported to show potent antiulcer effects like *Cynodon dactylon, Ocimum sanctum, Glycyrrhiza glabra, Ficus religiosa, Mentha microphylla, Brassica oleracea Capitata, Brassica oleracea Botrytis, Portolaca oleracean, Oreganum marjoranum, Matricaria recutita, Solanum nigrum, Portolaca oleracea, Cicorium intybus, Panax japonicas, Kochia scoparia, Linderae umbellatae* and *Gum arabic*. This review critically discusses the pathogenic mechanisms involved in the development and progression of peptic ulcers, and the potential offered by herbal drugs in the treatment of the same.

Keywords: *Peptic ulcer, Gastrointestinal disorders, Proton pump inhibitors, Herbal drugs, Treatment.*

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Biotechnology Developments in Protein, Gene, and Cell Therapies

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Abstract: Pharmaceutical biotechnology has made significant advancements in recent years, with some of the most notable examples being the emergence of antibody-based checkpoint inhibitor therapy as a new pillar of cancer treatment, the first FDA approvals of genetically modified T-cell therapy, the first autologous gene therapy approved by the European Medicines Agency for the treatment of severe combined immunodeficiency disorder (SCID). The discovery and development of protein-based treatments are being expanded by recent advances in protein engineering and characterisation. This trend is best illustrated by the ongoing maturation of monoclonal antibody screening and development. Any small alterations to protein side chains can considerably modify the protein properties. It is crucial to take into account not just the characteristics of biologics but also the biomanufacturing and storage procedures that enable manufacture and distribution feasible if biological treatments are to reach their full potential. However, the major challenge for the development and production of protein-based biopharmaceuticals is in-vivo distribution which continues to be a significant barrier to maximising the potential of biologics. Ongoing improvements in the discovery, development, and production of protein-based biologics are utilising accumulated foundational knowledge to create new generations of highly efficient, targeted, and stable biologics. Additionally, the development of pharmaceutical biotechnology beyond protein-based methods is bringing new kinds of medications, such as cell and gene treatments, to the clinic. Furthermore, the combination therapy could result in powerful, multidimensional attacks on even the most intractable diseases as a result of this rising arsenal of biologics. High optimism exists in the field of pharmaceutical biotechnology as a result of these alluring possibilities.

Keywords: *Pharmaceutical biotechnology, Biologics, Drug discovery, Cell therapy, Protein-based treatment.*

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Artificial Intelligence in Drug Discovery and Development

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Abstract: Drug discovery and development is a time-consuming and high–risk process. It takes about 12-18 years with an average cost of 1-3 billion $. This problem can be tackled with the use of artificial intelligence (AI) to reduce the odds of drug discovery and development. The pharmaceuticals market requires more efficient drug development and production for its development and with the help of AI, this can be done on a large scale as drug discovery and development includes the discovery of a drug from its extraction to running successful clinical trials with the record of its effects, efficiency, mechanism and side effects and it is easily available to masses. AI has a lot of potentials to give a boost to the pharmaceuticals sector and solve a number of problems in a much simple way. AI can be used to diagnose a disease, and study the efficiency and side effects of a drug. It can widely be used to maintain data and documents in a much more precise way. With the help of AI, we can recapitulate human physiology to study the various property, reactions, mechanisms, etc., of a drug in the human body. AI can be used to run clinical trials effectively in a lesser amount of time. AI techniques used in development can bring the drug development process and the use of various models closer to medicinal chemists.

Keywords: *Drug discovery, Drug development, Artificial Intelligence, Medicinal chemistry, Drug design.*

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Leukaemia

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Abstract: Leukaemia is a blood condition in which the creation of aberrant white blood cells from lymphatic and bone marrow also the generation of regular blood cells, which are necessary to fight infections, carry oxygen, and assist in blood clotting in bleeding situations, are impacted by the overproduction of these white blood cells and results in leukaemia. Blood Cancer has become a major issue of concern to the world in recent years. With the uprising in leukaemia patients, the cure and treatment related to it have been a topic of great fuss for the global pharmaceutical market and scientists. Leukaemia's early history dates back 200 years. A case of splenitis acutus with inexplicable milky blood was described by Peter Cullen. By the ongoing research, leukaemia is divided into acute and chronic and the symptoms include lymph nodes in your stomach, groin, underarm, or neck that swollen, as well as your spleen or liver, Bruising and bleeding easily, including nosebleeds, bleeding gums, and a rash that appears as purplish or darkening areas of skin or as tiny red dots on the skin. It is diagnosed by physical exam, complete blood count, bone marrow biopsy, and imaging. It is treated by chemotherapy, targeted therapy, radiation therapy, CAR T-cell therapy, and hematopoietic cell transplant. This review summarizes the pathophysiology, clinical presentation, diagnosis, and treatment of leukaemia.

Keywords: *Leukaemia, Background, Bone marrow, Symptoms, Diagnosis, Treatment, CAR-T cell therapy.*

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Pharmacological Potential of Hesperidin

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Abstract: Hesperidin is a secondary metabolite and a flavanone analogue of the flavone glycoside diosmin, which is a common constituent in many citrus species. It is widely distributed in fruits, vegetables, and foods of plant origin. Hesperidin is the primary flavonoid glycoside in oranges (*Citrus sinensis*) and lemon (*Citrus limonium*) and the predominant flavonoid in grapefruit (*Citrus paradisi*), contributing to its bitter flavour. Hesperidin has antioxidant properties, including free radical scavenging. It also has anti-inflammatory, anti-ulcer, blood lipid and cholesterol-lowering, and anti-carcinogenic activities. The mechanism of action of hesperidin as an antiulcer appears to be related to its effects on the protection of the gastric wall through the maintenance of the gastric mucosa. It promotes mucosal protection by changing the level of prostaglandins (PGE2). Basically, it increases the activity of the cyclooxygenase COX enzyme, by which the quantity of prostaglandin is also increased, and it also inhibits oxidative stress-induced apoptosis. Hesperidin's anti-hyperlipidaemic effect was shown in high-fat diet-induced rats, with a decrease in low-density lipoprotein (LDL) cholesterol and very low-density lipoprotein (VLDL) cholesterol and a rise in high-density lipoprotein (HDL) cholesterol. The present review aims to explore hesperidin's pharmacological potential, which will be beneficial for pharmaceutical scientists working in the field of targeted drug delivery.

Keywords: *Antihyperlipidemic, Antioxidant, Antiulcer, Hesperidin, Pharmacological action, Mechanism.*

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Diabetes is More than Tight Control of Hyperglycemia: Role of Metabolic Memory

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Abstract: Globally it is estimated that 382 million people suffer from diabetes with a prevalence of 8.3%. The progression of diabetes is accompanied by microvascular complications like retinopathy, neuropathy, nephropathy and macrovascular complications like cardiovascular disease. Evidence from several clinical trials conducted during the past two decades like DCCT, EDIC, STENO-2 STUDY & UKPDS, ADVANCE, VADT & ACCORD has demonstrated a metabolic memory of prior exposure to hyperglycemia that continues to persist despite subsequent glycaemic control using pharmacological intervention or insulin treatment. Metabolic memory remains a major challenge in the treatment of diabetes-associated vascular complications. The most widely accepted mechanism underlying the metabolic memory phenomenon is the epigenetic modification of histone protein around which DNA is wrapped. The finding from the above clinical trials clearly shows that treatment with pharmacological intervention is not sufficient to reverse established metabolic memory. Therefore, there is a need for the development of novel strategies to halt the progression of metabolic memory by targeting epigenetic mechanisms in diabetes.

Keywords: *Diabetes mellitus, Metabolism, Microvascular complications, Macrovascular complications.*

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Emerging Role of VDR in Diabetic Nephropathy

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Abstract: Diabetic nephropathy is a secondary complication in about 40% of the diabetic patients. It is a progressive kidney disease caused by angiopathy in capillaries in kidney glomeruli that often leads to kidney failure and even death. Vitamin D receptor (VDR) is a ligand-gated ion channel receptor localised in both proximal and convoluted tubules of nephrons in adult kidney, that plays an essential role in the normal physiology of the kidney by modulating the expression of genes that prevents or slows the development of secondary hyperparathyroidism, bone disease, and abnormalities in calcium and phosphate homeostasis. Numerous publications reveal the relationship between the overactivation of the renin-angiotensin system (RAS) and decreased expression of VDR in diabetic kidney. The goal of these studies is to review the interaction between RAS and VDR in diabetic nephropathy and how it reduces glomerulosclerosis and tubulointerstitial fibrosis and plays a key role in limiting the pathogenesis of diabetic nephropathy.

Keywords: *Vitamin D receptor, VDR, Renin angiotensin system, RAS, Diabetic nephropathy, Fibrosis.*

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Machine Learning in Drug Discovery and Development

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Abstract: Finding novel substances with particular chemical characteristics for the treatment of diseases is the goal of drug discovery. For well-defined problems with a lot of good data, machine learning (ML) approaches offer a collection of tools that can enhance discovery and decision-making. The development and use of ML algorithms and software have begun at all stages of drug discovery and development, including clinical trials, to identify novel targets, strengthen target-disease associations, improve the small-molecule compound design and optimization, increase understanding of disease mechanisms, increase understanding of disease and non-disease phenotypes, develop new biomarkers for prognosis, progression, and drug efficacy, and improve analytical methods. In the pharmaceutical business, a wide range of ML techniques have been applied to the prediction of novel molecular properties, biological activities, interactions, and side effects of medications. Naive Bayes, Support Vector Machines, Random Forest, and, more recently, Deep neural networks are a few examples of these techniques. Even though all study domains share some steps in the experimental design, the use of an ML approach must be cross-disciplinary. We can distinguish the following steps in the ML methodology used in drug discovery specifically: Data gathering, creating mathematical descriptors, finding the best selection of variables, training a model, and model validation are the first four steps. The use of ML in drug discovery and development offers the potential to accelerate the process, lower failure rates, and encourage data-driven decision-making.

Keywords: *Drug discovery, Machine learning, Deep neutral networks, Algorithms, Target disease, Software.*

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Emerging Trends in Therapeutic Monoclonal Antibodies

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Abstract: Monoclonal antibodies are a promising class of targeted anticancer medicines that improve the functioning of the body's immune system to inhibit the growth and spread of cancer cells. The development of other therapeutic antibody types, including antibody fragments, bispecific antibodies, and antibody derivatives, was inspired by the successful use of IgG monoclonal antibodies. Monoclonal antibodies (mAbs), which are directed against specific, targeted molecules involved in pain signalling and processing pathways, appear to be very effective and promising as a novel therapeutic for the treatment of chronic pain. The following mAbs, among others, are already advised for the treatment of chronic pain conditions: tumour necrosis factor, nerve growth factor, calcitonin gene-related peptide, and interleukin-6. Therapeutic monoclonal antibodies have drawn a lot more attention in recent years. The development of a new generation of therapeutic drugs is being made possible by the emergence of molecular-targeted medicine. Their extremely specific targeting of antigens can result in very successful medical treatment. The use of human mAbs that are capable of neutralizing SARS-CoV-2 and its variations is a promising therapeutic approach. The present study provides deep insight into the therapeutic applications of mAbs along with their future prospects.

Keywords: *Monoclonal antibodies, Inflammation, Chronic pain, Pre-clinical, Clinical trials, Interleukin-6.*

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Green Synthesis of Silver Nanoparticles of Sandalwood

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Abstract: Silver nanoparticles have various applications, such as ointments, drug delivery, nanomedicine, cell biology, the food industry, antioxidants, and antibacterial activity. Green synthesis is an eco-friendly and biocompatible process, generally accomplished by using a capping agent/stabilizer (to control the size and prevent agglomeration). Aq. Soln. (1 mM) $AgNO_3$ in 250 ml flask in which leaf extract was added. Kept on microwave oven at 300W for 4 min (reduction of Ag+ to Ag0). Colour change was monitored (faint light to yellowish brown to colloidal brown). Scanning by UV-Visible Spectrophotometer maximum of 30 minutes (time and colour change noted). The dilute colloidal solution was cooled to room temperature. Kept aside for 24 hr. for complete bio-reduction and saturation. The colloidal mixture was sealed and stored properly for future use. Formation of AgNPs confirmed by spectrophotometric analysis. A literature survey revealed that the above-stated silver reduction method to produce silver nanoparticles of sandalwood would have better results than the other stated methods in the literature.

Keywords: *Nanotechnology, Silver nanoparticles, Sandalwood, Sustainability, Green synthesis.*

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SLNs as Novel Drug Carrier for Improving Oral Bioavailability

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Abstract: Drugs that are poorly soluble in water often face difficulties in developing conventional dosage forms due to critical factors like poor oral bioavailability, slow onset of action, lack of dose proportionality, inability to reach study state plasma concentrations, and adverse effects. The present review aimed to improve the oral absorption of poorly soluble drugs by the use of solid lipid nanoparticles (SLNs). SLNs are submicron-size nanoparticles, which are made up of biocompatible and biodegradable lipids and are capable of incorporating both lipophilic and hydrophilic drugs. For the first time, SLNs were introduced in 1991 as a substitute for traditional colloidal carriers like emulsion, liposome and polymeric micro/nanoparticles. Furthermore, due to their ease of manufacturing processes, scale-up capability, biocompatibility, and also biodegradability of formulation constituent they gained much attention for the oral absorption of drugs. The enhanced oral absorption in SLNs is mainly attributed to a reduction in the particle size and the lipid protection of the drug from chemicals as well as enzymatic degradation. Generally, the methods used to formulate SLNs have been well investigated, but the solvent injection method provides an alternative means of preparing these drug carriers. The advantages of the solvent injection method include a fast production process, easy handling, and applicability in laboratories without the requirement of complicated instruments. The SLNs as novel drug carrier is useful in enhancing the oral bioavailability of poorly soluble drugs.

Keywords: *Solid lipid nanoparticles, Bioavailability, Absorption, Lipophilic, Hydrophilic, SLNs.*

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Phytochemical and Pharmacological Properties of *Ziziphus nummularia*: A Comprehensive Review

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Abstract: *Ziziphus nummularia*, a small prickly low shrub of the Rhamnaceous family, is a multipurpose wild economic species adapted to dry arid and semi-arid regions. The genus is rich in bioactive molecules, traditionally known for its nutritional value, therapeutic properties and health benefits around the world, particularly in India, Pakistan and Middle Eastern countries. To congregate the latest knowledge about the medicinal and pharmacological characteristics specifically its phytochemical constituents and their role in the treatment of various diseases like diabetes, cardiovascular disorders, cancer, etc. Scientific literature databases like PubMed, Scopus, Science Direct, general web searches, and SciFinder were utilized. The search used the keywords like *Ziziphus nummularia*, phytoconstituents, medicinal effects, pharmacological activities, anticancer, traditional uses, antioxidant, gastrointestinal, etc. The secondary metabolites mainly include alkaloids (cyclopeptides), flavonoids, terpenoids, glycosides and phenolic constituents. These phytoconstituents are responsible for their pharmacological and toxicological profile (antioxidant, anti-inflammatory, analgesic, anticancer, antidiabetic, antimicrobial and cardioprotective). In addition, the plant has anti-thermal and anti-drought properties. The present research is focusing more attention on plant-based drug delivery for the management of many diseases which are challenging to the modern healthcare system. Nanotechnology is rapidly emerging due to its application in drug delivery, focusing majorly on the green synthesis of nanoparticles. Indeed, during the formation of nanoparticles, the extract of *Z. nummularia* itself serves as a reducing and stabilizing agent, therefore increasing its potential activity. Numerous studies describe that *Z. nummularia* is rich in bioactive compounds and is responsible for its pharmacological activities. Altogether, *Z. nummularia* may represent a new potential target for the discovery of new drug leads.

Keywords: *Ziziphus nummularia, Cyclopeptide, Anti-thermal, Antioxidant, Nanoparticles, Phytochemistry.*

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Effect of Plants-Based Scaffold on Wound Healing Treatment

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Abstract: Skin is the most important organ of the human frame. It acts as a barrier and protection to the complete human body. When skin gets injured the repair process entails the removal of the damaged tissue and the laying down of a new extracellular matrix over which epidermal continuity can be re-established. In general, systems intended for the treatment and recovery of wounds seek to act as a coating for the damaged area, maintaining an adequate level of humidity reducing pain, and preventing the invasion and proliferation of micro-organisms. Diabetic wound repair and skin regeneration remain a worldwide challenge due to the impaired functionality of re-vascularization. When a serious cutaneous injury occurs the innate wound healing process attempts to restore the skin's appearance and function wound healing outcome is affected by factors such as contraction, re-vascularization, regeneration versus fibrosis and re-epithelialization and is also strongly influenced by the pattern and extent of damage to dermal layer then data generated through a systemic investigation carried out an evaluation of phytoextracts on wound healing research during the last 20 years have been compiled. About 450 plant species have wound-healing properties. Scaffolds typically made of polymeric biomaterials, provide the structural support for cell attachment and subsequent tissue development. Herbal scaffolds are applied to treat chronic wounds. For example, fibrin gels, collagen-based scaffolds, amniotic membranes, phytochemicals such as phenolic acids, flavonoids, tannins, alkaloids, terpenes and even functional phytohormones. It was the endeavour to identify the active constituents responsible for antimicrobial activity, free radical scavenging properties, and stimulators of enhanced collagen production with the identification of lead scaffold chemical structures. Multiple phytochemicals concentrated and blended in optimal concentrations are expected to be available in future years to carry out multiple tasking efforts in wound healing.

Keywords: *Wound healing, Diabetic wound, Scaffold, Skin regeneration, Injury, Plant-based, Phytochemicals.*

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Role of Silymarin in the Treatment of Hepatic Disease

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Abstract: Silymarin, an extract from milk thistle seeds, has been used for centuries to treat hepatic conditions. Preclinical data indicate that silymarin can reduce oxidative stress and consequent cytotoxicity, thereby protecting intact liver cells or cells not yet irreversibly damaged. It is used in different liver disorders, particularly chronic liver diseases, cirrhosis and hepatocellular carcinoma, because of its antioxidant, anti-inflammatory and antifibrotic power. Silymarin is able to increase cellular vitality and reduce both lipid peroxidation and cellular necrosis. Furthermore, silymarin/silybin use has important biological effects in non-alcoholic fatty liver disease. The antitoxic effects of silymarin against the Amanita phalloides toxins phalloidin and α-amanitin are mediated by the inhibition of the binding of phalloidin to specific receptors on liver cell membranes and by the antagonism to the blocking effects of α-amanitin on RNA polymerase. Silymarin is generally very well tolerated, with a low incidence of adverse events and no treatment-related serious adverse events or deaths reported in clinical trials. For maximum benefit, treatment with silymarin should be initiated as early as possible in patients with fatty liver disease and other distinct liver disease manifestations such as acute liver failure, when the regenerative potential of the liver is still high and when removal of oxidative stress, the cause of cytotoxicity, can achieve the best results.

Keywords: *Milk thistle, Anti-inflammatory, Antitoxic, Liver diseases, Cytotoxicity, Clinical trials.*

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Optimization of Process Parameters using Fraction Factorial Design Analysis for Effective Adsorption of Cr(VI) by Maize Cob Husk

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Abstract: Effective adsorption of Cr(VI) using maize cob husk can be obtained using a two-level Fraction factorial process optimizing design. Adsorption of Cr(VI) from aqueous solution using maize cob husk is impacted by various factors that must be under control. Using Fraction factorial designs, the ideal circumstances for the removal of Cr(VI) can be obtained. Thus, in the present study, the impact of five factors on adsorption rate was investigated: contact time, adsorbent dose, pH, Cr(VI) content, and temperature. The two-level Fraction factorial design utilised for optimization takes pH, Cr(VI) content, and cob maize husk. Maximum chromium elimination rate demonstrating the appropriateness of the experimental domain. Furthermore, the pH and chromium concentration, two of the three parameters, have a big impact on the rate of chromium removal. Additionally, interactions between pH and concentration of Cr(VI) as well as those between maize husk doses and Cr(VI) concentration have a big impact on adsorption. Thus, by optimizing the parameters, it is possible to get enhanced Cr(VI) removal with the changed circumference. The combination of the effects of variable factors is examined using a fractional factorial design model in order to get the maximum removal of Cr(VI).

Keywords: *Optimization, Process parameters, Factorial design, Maize cob husk, Adsorption, Chromium (VI).*

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A Systemic Review on Phytochemical & Pharmacological Aspects of Orange Peel

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Abstract: *Citrus aurantium* (bitter orange) is a plant belonging to the family Rutaceae and possesses multiple therapeutic potentials. It contains an active ingredient called synephrine that is similar to ephedra. The most important biologically active constituents of the *C. aurantium* fruits are phenethylamine alkaloids octopamine, synephrine, tyramine, N-methyltyramine and hordenine. It is rich in vitamin C, flavonoids and volatile oil. The fruit also contains coumarins. These biological uses are anticancer, antianxiety, anti-obesity, antibacterial, antioxidant, pesticidal, and antidiabetic activities. *C. aurantium* is also used for the treatment of several ailments such as anxiety, lung and prostate cancer and gastrointestinal disorder and obesity. The essential oil of *C. aurantium* was reported to display marked pharmacological effects and great variation in chemical composition depending on growing locations but mostly contained limonene, linalool and β -myrcene mostly composed of terpenes. Food supplements containing *C. aurantium* are supposed to increase energy expenditure or lipolysis or reduce appetite.

Keywords: *Bitter orange, Citrus aurantium, Phytochemistry, Synephrine, Pharmacological effects.*

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A Systemic Review on Phytochemical and Pharmacological Aspects of *Andrographis paniculata*

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Abstract: *Andrographis paniculata* (Burm. F.) belongs to the family Acanthaceae and is also known as Kalmegh. It is widely distributed in various countries like India, Sri Lanka, Pakistan, China, Hong Kong, Thailand and Singapore. In the Unani and Ayurvedic medicinal systems, it is used for the treatment of snake bites, bug bites, diabetes, dysentery, fever and malaria. Whole plant leaves and roots are also used as a folklore remedy for different diseases in Asia and Europe. The compositions of phytochemicals widely differ in terms of the part used geography, season, and time of harvesting. The aerial part contains diterpenoids, diterpene glycosides, lactones, flavonoids, and flavonoid glycosides. Andrographolide (AP) has been reported to have a broad range of pharmacological effects including anti-cancer, anti-diarrheal, anti-hepatitis, anti-hyperglycemic, anti-inflammatory, anti-microbial, anti-malarial, anti-oxidant, cardiovascular, cytotoxic, hepatoprotective, immunostimulatory, anti-HIV and in sexual dysfunctions. Besides the AP and andrographolide, andrographolide derivatives andrographolide and its analogues have great potential to be the next new class of anti-inflammatory agents, and more andrographolide molecules are likely moving towards the clinical study stage in the near future.

Keywords: *Andrographis paniculata, Phytochemistry, Medicinal plants, Pharmacological effects.*

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A Systemic Review on Phytochemical and Pharmacological Aspects of Garlic

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Abstract: Garlic (*Allium sativum)* is an aromatic herbaceous plant that is consumed worldwide as food and a traditional remedy for various diseases. We searched the Medline database in PubMed by using the medical subject "Garlic". Garlic contains high levels of phosphorus, potassium, sulfur, and zinc; moderate levels of selenium, vitamins A and C; and low levels of calcium, magnesium, sodium, iron, manganese, and B-complex vitamins. In addition, many compounds have been identified and isolated from garlic extracts including 33 sulfur compounds and 17 amino acids, which include alanine, arginine, aspartic acid, asparagine, histidine, leucine, methionine, phenylalanine, proline, serine, threonine, tryptophan, and valine. The most important chemical constituents of this plant are organosulfur compounds such as allicin, diallyl disulfide, S-allyl cysteine, and diallyl trisulfide. Phytochemicals are used for the treatment of inflammation, cancer, blood pressure, atherosclerosis, hyperlipidemia, etc. Additionally, extracts of garlic have been used to treat various diseases and have shown anti-viral, anti-bacterial, anti-fungal, anticoagulative and antioxidant effects.

Keywords: *Garlic, Allium sativum, Phytochemistry, Antibacterial, Anticancer, Antioxidant, Inflammation.*

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Formulation and Development of Polymeric Nanoparticles using Doxorubicin for the Treatment of Lung Cancer

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Abstract: Polymeric nanoparticles (PNPs) have attracted considerable interest over the last few years due to their unique properties and behaviours resulting from their small size. Advantages of PNPs as carriers include controlled release, the ability to combine both, therapy and imaging (theranostics), protection of drug molecules and their specific targeting, and facilitating improvements in the therapeutic index. The classic mechanism for controlling drug release from PNPs is achieved by regulation of the rates of polymer biodegradation and drug diffusion out of the polymer matrix. More recently, exogenous and endogenous stimuli triggered drug release is of particular interest, as it is selective to the microenvironment of specific diseases. The technology of polymeric drug delivery relies heavily on the biodegradability and biocompatibility of the polymers. Biodegradable polymers have advantages since they are completely eliminated from the body by natural metabolic pathways. Several synthetic or natural polymers have been used for the preparation of PNPs, such as proteins, sugars or other natural macromolecules, biodegradable polymers and non-biodegradable, but pharmaceutically acceptable polymers. To self-assemble these materials into PNPs, several preparation techniques have been successfully developed. The choice of a specific method is usually determined by the type of polymer, the drug's physicochemical properties and the final desired characteristics of the PNPs.

Keywords: *Nanotechnology, Polymeric nanoparticles, Biodegradable polymers, Polymer matrix, Specific targeting.*

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Lung Cancer

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Abstract: Lung cancer is the most diagnosed cancer that leads to death worldwide. Lung cancer is approved to be 5.9 % of all cancers. About 80% of patients suffering from lung cancer are because of smoke, air pollution, nickel or family history. Lung cancer is a malignant tumour characterized by uncontrolled cell growth in tissues of the lung. Common treatments include surgery, chemotherapy, and radiotherapy. Also, one of the major and nature-caused compounds radons leads to severe lung cancer. Non-small cell lung cancer is major of all lung cancer it is mainly due to citrate or smoking leads to this cancer. Carcinogens in tobacco such as coal tar which directly interact with the DNA of lung cells as carcinogens are exposed to whole lungs. There are some molecular changes in the mucosa of smokers. Moreover, environmental and genetic factors also contribute to it. There is platinum-based chemotherapy which is disappointing in the case of non–small cell lung cancer. The survival rates in non-small cell lung cancer are less. New drugs and research on them are needed to ensure the improvement in non-small cell lung cancer (NSCLC). In spite of advances in early diagnosis and standard treatment, non-small cell lung cancer is regularly analysed at advanced stages and has a poor prognosis. The treatment and prevention of lung cancer are major needs that can most likely be enhanced by a better understanding of the molecular process in cancer and the development of cancer.

Keywords: *Cancer, Carcinogens, Chemotherapy, Radiotherapy, Non-small cell lung cancer, Diagnosis.*

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Lung Cancer

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Abstract: In the last few decades, there is advancement in the treatment used to cure various diseases, especially cancer. Mainly, lung cancer is a major cause of very high mortality rates all over the world. As patients' life prolongation depends on the treatment conventional methods like chemotherapy and radiotherapy are not able to prolong the life of patients so the use of nanoparticles is taken into consideration for the treatment of lung cancer. Nanoparticles are those particles which are a diameter between 1 and 100 nm. These nanoparticles ensure target drug delivery at the particular site of the lung. This is due to the specific ligand structure which is loaded with an anticancer drug that provides effect by binding at the specific site of the receptors on the lung surface. T-cell membrane-coated nanoparticles are mainly used in lung cancer. Recently many nanoparticles are investigated that are used in lung cancer like liposomes, and polymeric micelles. Nanoparticles have good biocompatibility as many of them are biodegradable and have the capability to protect nucleic acids. There are various methods for the optimization of nanoparticles so there must be a sustained release of drugs to cure lung cancer. There are used they can be natural, synthetic and semi-synthetic. Most of the nanoparticles are used in lung cancer and some are still in clinical trials.

Keywords: *Nanoparticles, Liposomes, Polymeric micelles, Biocompatible, Biodegradable, Target drug delivery.*

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Risk of Colorectal Cancer in Inflammatory Bowel Disease Patients

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Abstract: Patients with long-standing inflammatory bowel disease (IBD) have an associated magnified risk of developing body part colorectal cancer (CRC). Several of the molecular alterations to blame for isolated body part cancer, particularly body instability, microsatellite instability, and hypermethylation, conjointly play a task in colitis-associated colon carcinogenesis. Increased risk of colorectal cancer (CRC) in inflammatory bowel disease (IBD) patients has been attributed to long-standing chronic inflammation, with the contribution of genetic alterations and environmental factors such as the microbiota. Carcinoma risk in inflammatory IBD will increase with a longer length of rubor, the larger anatomic extent of rubor, the presence of primary sclerosing redness, case history of CRC and the degree of inflammation of the intestine. To reduce CRC mortality in IBD, colonoscopic surveillance with random biopsies remains the major way to detect early mucosal dysplasia. Once an abnormality is confirmed, proctocolectomy is taken into account for these patients. Patients with little enteric Crohn's malady are at magnified risk of small intestine carcinoma. Colitis patients with total proctocolectomy and ileal pouch anal-anastomosis have a rather low risk of abnormality within the ileal pouch, however, the anal transition zone ought to be monitored sporadically. IBD-CRC may be at least partially prevented through mucosal healing of intestinal lesions, and the potential anti-tumour effects of IBD drugs. Several guidelines for surveillance strategy have also recently endorsed the use of a targeted biopsy that incorporates chromoendoscopy or some new technologies instead of multiple random biopsies.

Keywords: *Inflammatory bowel disease, Colorectal cancer, Chromoendoscopy, Colonoscopic surveillance.*

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Hybrid Carriers: A Novel Approach to Target Lung Cancer

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Abstract: Nanoparticles in Microparticles System (NiMS) is the delivery system in which the particles of nano and micro ranges are ensembled for drug and gene delivery in specific parts of the body. Nanoparticle-in-microparticle systems (NiMS), offer the possibility of dual or multiple functionalities within a formulation. For example, multiple release profiles (burst release from outer particles and sustained release from internal components) and combinations of features allow site specificity. Microparticulate systems have attracted a great deal of attention over the past few years as carriers for the delivery of cells and proteins in the treatment of defective tissues. For pharmaceutical applications and in order to improve their administration (oral, pulmonary and dermal), the nanocarriers can be spread into microparticles. The composition of microparticulate is regarded as being of utmost importance for the successful recruitment of the cells involved in the tissue regeneration process. The design of nanostructures and nanometer-scale fabrication is driven not only by the novel yet unexplored properties associated with nanoscale materials, but also by the continuously increasing demand for further miniaturization of electronic components, optical detectors, and chemical and biochemical sensors and devices.

Keywords: *Nanoparticles, Nanocarriers, Pharmaceutical applications, Micro-particulates system, Sustained release, Target drug delivery system.*

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Vitamin E TPGS-based Drug Delivery Systems: Multifarious Applications in Cancer Therapy

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Abstract: In many instances, battling the various types of cancers using chemotherapeutic agents is ultimately a challenging task due to poor solubility and poor permeability, multi-drug resistance, toxicities, stability and poor pharmacokinetic profile of the anticancer drugs. In that context, D-tocopheryl polyethylene glycol succinate (TPGS) is an excellent, biocompatible safe, non-ionic, and more hydrophilic surfactant which is recommended by FDA for its use to develop drug delivery systems. It is a P-gp inhibitor, which helps to improve the efficacy and safety of chemotherapeutic agents in cancer therapy. Several studies revealed that TPGS can induce apoptosis and exhibits selective cytotoxic effects against a wide range of cancers and combined with the anticancer drug it has great potential to decrease the side of drugs. Additionally, TPGS helps to improve the pharmacokinetic properties of loaded/tagged anticancer drugs. TPGS-based drug delivery systems can emerge as a promising approach for different diseases and can occupy the market in a few years. Moreover, some studies highlight that TPGS enhances intestinal lymphatic transport and chylomicron production significantly at low doses, which may aid in enhancing medication absorption. It also shows that there are still a lot of problems with the clinical translation of TPGS-based nanoformulations, necessitating further study or in-depth investigations about TPGS and a future-based delivery mechanism.

Keywords: *Anticancer drugs, TPGS, Nanotechnology, Nanoformulations, Cancer therapy, Drug delivery systems.*

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Tirazeptide: A Potent Drug Target in the Management of Obesity in Patients with or without Diabetes

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Abstract: Obesity and cardiovascular complications are the two pandemics which plays a crucial role in the pathophysiology of type 2 diabetes. Loss of weight and increased cardiovascular risk is becoming hurdles for the diabetic population. The tremendous hike in the rate of obesity is one of the main reasons for the increased cases of diabetes mellitus and hence, obesity becomes a high-risk factor for diabetes. Tirazeptide, a dual GIP/GLP-1 agonist was initially developed for the treatment of diabetes but was found to be effective not only for glycemic control but also for weight loss. Based on previous studies and clinical trials, it is observed that tirazeptide is a more efficacious drug than other approved drugs in weight management therapy and has the advantage of improving the blood glucose profile and reducing cardiovascular risk also. Additional studies are needed to check its long-term efficacy and safety in the management of weight loss. This study aimed to assess the clinical efficacy of tirazeptide in the management of weight loss, and also to compare the effect of tirazeptide with other approved anti-obesity drugs, and discuss the mechanisms by which GLP-1 and GIP agonist, used in weight loss therapy.

Keywords: *Obesity, Tirazeptide, Type 2 diabetes, GIP/GLP-1 agonist Cardiovascular risk, SCALE program.*

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A Critical Overview on Pyrazole and Imidazole Derivatives as Anti-Inflammatory Drugs

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Abstract: When the body is infested with pathogens or has tissue damage, it reacts by sending certain organic molecules and WBCs to the site via increased blood flow which leads to a multi-fold response termed inflammation. Sentinel cells produce mediators of inflammation (proteins/kinins). Mast cells produce chemicals like serotonin & histamine. Macrophages produce cytokines like COX, TNF-α, IFN, IL-1β, and NF-κB. This release increases the flow of blood in the area which exhibits as redness, hotness and swelling (excess fluid in the vicinity), pain, appetite loss and fever etc. The target pathway for inflammation in drug discovery is the metabolism of Arachidonic acid that is mediated by cyclo-oxygenase/COX (produces prostaglandins) & 5-1ipoxygenase (produces leukotrienes and other lipoxygenase products). We can intervene/target several steps in this pathway to reduce inflammation. The mainstream anti-inflammatory therapies in practice usually target the enzymes; COX-1/COX-2, lipoxygenase/leukotrienes (LTB4, LTC4, LTD4 and LTD4), Phospholipase A2 (PLA2), matrix metalloproteases, chemokines, cytokines and protein tyrosine kinases Phosphodiesterase. Steroids, NSAIDS and anti-histamines usually target either COX-1/COX-2 or its mediators. TNF-α-neutralizing agents, anti-IgE and anti-CD20 antibodies, and disruption of cells responsible for inflammation (e.g., T-cells); like antibodies to α4β7 (integrin) and CTLA-4-Ig are other means. As all of these treatments have significant side effects so, the hunt for newer molecules is still going on, and this article entails the significance of pyrazole and imidazole moieties as significant scaffolds for anti-inflammatory activity.

Keywords: *Pyrazole derivatives, Imidazole derivatives, Anti-inflammatory activity, COX-1, Cox-2.*

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Ethnopharmacology and Therapeutic Potential of *Ailanthus excelsa* Roxb: An Outlook

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Abstract: The genus Ailanthus, which includes both evergreen and deciduous species, is native to both Asia and northern Australia. Traditional medicine relies heavily on this plant, and various components of the plant are utilized to treat a wide range of illnesses. Herbal and ayurvedic drugs have gained worldwide attention over the past decade for their potential health and financial benefits. There are now major worries about the quality, safety, and efficacy of herbs due to their regular and extensive use around the world. As a result, credible scientific data or evaluation is required before health claims made about herbs may be considered valid. The foundation for this tree's status as a plant of heaven includes traditional assertions, phytochemical studies, pharmacological examination, and some ayurvedic formulations. Therapeutic effects are found throughout the plant. The bark is employed in the treatment of dysentery, earaches, skin diseases, rectum problems, fever related to tridosha, and in the alleviation of thirst. Furthermore, it is prescribed for patients suffering from bronchitis, asthma, bronchitis, dyspepsia, gout, and rheumatism. In Ayurveda, it is recommended for those with a sour palate. Extracts from the bark of the stem were shown to have strong antibacterial and antifungal properties. Flavonoids, quassinoids, alkaloids, terpenoids, sterols, and saponins have all been found in this plant. Ethnobotanical research shows that *Ailanthus Excelsa Roxb* is full of different chemical compounds that may have a wide range of effects on living things. The traditional claims, as well as the pharmacognostical, phytochemical, pharmacological, and future potential of this plant, are discussed in this review. Researchers are still looking for ways to use naturally occurring molecules to treat human diseases, according to new information. This information also points the way toward the discovery of more naturally occurring and new semisynthetic or synthetic compounds with similar effects.

Keywords: *Ailanthus Excelsa Roxb, Ethnopharmacology, Therapeutic applications, Herbal products, Phytochemistry.*

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