P. R. S Educational Trust

In Collaboration With

School of Pharmaceutical Education and Research, Jamia Hamdard

and

Delhi Pharmaceutical Sciences and Research University

International Conference on

"Current and Future Perspectives of Pharmaceuticals in Health Care"

CFPPHC-2023

Program Schedule

Date:

13th May 2023

Venue:

Constitution Club of India, New Delhi

conference.prseducationaltrust@gmail.com

P. R. S. Educational Trust

CFPPHC-2023

May 13, 2023 (Venue: Hall-1; Constitutional Club)

Programme Schedule

Time	Event	Speaker
9:30 am to 10:00 am	**Registration**	
	Inauguration	
10:00 am to 10:05 am	Recitation of the Holy Quran	**Mr. Khursheed A Sheikh**, Research Scholar
10:05 am to 10:10 am	Felicitation of Guests	
10:10 am to 10:15 am	Welcome Address	**Prof. (Dr.) R. K. Khar** Organizing Chairman
10:15 am to 10:25 am	Introduction of PRS Society	**Dr. Shaweta Sharma** Member Trustee of PRS Educational Trust
10:25 am to 10:32 am	Address by Guest of Honor	**Prof. (Dr.) Avadhesh Kumar** Pro-VC-Galgotias University Chancellor
10:32 am to 10:39 am	Address by Guest of Honor	**Prof. (Dr.) R.K Suri** Pro-VC, Delhi Skill and Entrepreneurship University
10:39 am to 10:47 am	Address by Guest of Honor	**Prof. (Dr.) Afrozul Haq** Vice Chancellor, HA University, Imphal
10:47 am to 11:07 am	Address by Chief Guest	**Dr. Rajeev Singh Raghuvanshi** Drug Controller General of India
11:07 am to 11:14 am	Conferment of Prof. S. K. Singh Memorial Best Researcher Award instituted by the PRS Educational Trust	
11:14 am to 11:25 am	Presidential Remarks	**Prof. (Dr.) M. Afshar Alam** Vice Chancellor, Jamia Hamdard
11:25 am to 11:30 am	Vote of thanks	**Prof. (Dr.) Zeenat Iqbal** Convener
10:45 am to 11:31 am	National Anthem	
10:45 am to 11:45 am	High Tea	

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CFPPHC-2023

May 13, 2023 (Venue: Hall-1; Constitutional Club)

Time	Event	Speaker
	SCIENTIFIC SESSION 1: SPEAKER HALL	
11:45 am to 12:15 pm	**Lecture-I**	
	Title: Global Vitamin D Deficiency and it's known Non-Skeletal Consequences	**Prof. (Dr.) Afrozul Haq** Vice Chancellor, HA University, Imphal
12:15 pm to 12:45 pm	**Lecture-II**	
	Title: Logistics and supply chain management in Pharmaceutical Industry	**Dr. Naveen Kalra** , Director, Koshika Wellness Pvt Ltd
12:45 pm to 1:15 pm	**Lecture-III**	
	Title: Industry expectations in rapidly growing era	**Dr. Rinku Kalra** Project Management, IPR Sun Pharma
1:00 pm to 2:15 pm	**LUNCH BREAK**	
	SCIENTIFIC SESSION 2: SPEAKER HALL	
2:15 pm to 2:45 pm	**Lecture-IV**	
	Title: Orthomolecular medicines: The avenue for current and future research	**Dr. Neeraj Kumar Fuloria** AIMST University, Malaysia
2:45 pm to 3:15 pm	**Lecture-V**	
	Title: Revolutionizing Rheumatoid arthritis treatment: The promise of small molecule inhibitors	**Prof. (Dr.) Sadiq Umar** University of Illinois Chicago, USA
3:15 pm to 3:45 pm	**Lecture-VI**	
	Title: Mechanistic role of Phyto-therapeutics as palliative and Anti-Cancer compound against various types of Cancer	**Dr. Sanchit Sharma** Director, AIMIL Pharmaceuticals
3:45 pm to 4:15 pm	**Lecture-VII**	
	Title: Trends in drug delivery: moving towards better health outcomes	**Dr. Sushama Talegaonkar** DPSRU, New Delhi
4:15 pm to 4:25 pm	**Lecture-VIII**	
	Title: Role of functional excipients in development of advanced pharmaceuticals.	**Dr. M. Aamir Mirza** SPER, New Delhi
	VALEDICTORY SESSION: SPEAKER HALL	
4:25 pm to 4:35 pm	Prize Distribution	Oral & Poster Presentation
4:35 pm to 4:45 pm	Felicitation of Committee Members	
4:45 pm to 4:50 pm	Vote of Thanks	Prof. (Dr.) Aftab Alam, Co-Convenor
4:50 pm to 5:00 pm	Tea and distribution of certificates	

NOTE: PARALLEL SESSION: ORAL AND E-POSTER PRESENTATION IN DEPUTY SPEAKER HALL FROM 10:30AM TO 2:00PM

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Organizes

International Conference on

"Current and Future Perspectives of Pharmaceuticals in Health Care"

Guest Honor

Prof.(Dr.) Avadhesh Kumar
Pro Vice-Chancellor,
Galgotias University,
Greater Noida, UP

Guest Honor

Prof. (Dr.) Rihan K Suri
Pro Vice-Chancellor,
Delhi Skill and Entrepreneurship University
(Govt. of NCT of Delhi)

Guest Honor

Prof. Afrozul Haq
Vice Chancellor
HA University Imphal
Manipur

Chief Guest

Dr. Rajeev Singh Raghuvanshi
Drugs Controller General of India

Presided by

Prof. (Dr.) P. K. Sahoo
Director,
DIPSAR, New Delhi

Date: 13th May 2023 ● **Venue: Constitution Club of India, New Delhi**

Patrons

Prof. (Dr.) Vidhu Aeri
Dean,
School of Pharmaceutical Education and Research,
Jamia Hamdard

Prof. (Dr.) P.K. Sahoo
Director,
Delhi Pharmaceutical Sciences and Research University,
New Delhi

Chairperson

Prof. (Dr.) R. K. Khar
Director
B. S. Anangpuria Educational Institutes,
Ballabgarh Sohna Road, Alampur, Faridabad

Co-Chairperson

Prof. (Dr.) M. Shahar Yar
Department of Pharmaceutical Chemistry, SPER,
Jamia Hamdard

Convenors

Prof. (Dr.) Zeenat Iqbal
SPER, Jamia Hamdard, New Delhi

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SPER, Jamia Hamdard, New Delhi

Prof. (Dr.) Tanveer Naved
Amity Institute of Pharmacy, Amity University,
Noida

Prof. (Dr.) Pawan Kumar Jalwal
Baba Mast Nath University, Rohtak

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SMAS, Galgotias University, Greater Noida

Prof. (Dr.) Rakesh Kumar Sindhu
College of Pharmacy, Sharda University, Noida

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Welcome

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Prof. (Dr.) M. Afshar Alam
Vice Chancellor, Jamia Hamdard, New Delhi

Patrons

Prof. (Dr.) Vidhu Aeri
Dean, School of Pharmaceutical Education and Research, Jamia Hamdard, New Delhi

Prof. (Dr.) P.K. Sahoo
Director, Delhi Pharmaceutical Sciences and Research University, New Delhi

Chairperson

Prof. (Dr.) R. K. Khar
Director, B. S. Anangpuria Educational Institutes, Ballabgarh Sohna Road, Alampur, Faridabad

Co-Chairperson

Prof. (Dr.) M. Shahar Yar
Department of Pharmaceutical Chemistry, SPER, Jamia Hamdard

Chief Guest

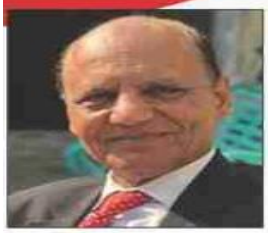
Dr Rajeev Singh Raghuvanshi
Drug Controller General of India

Prof. Ramesh K. Goyal
Hon'able Vice- Chancellor & Professor
Delhi Pharmaceutical Sciences
and Research University, New Delhi

Dr. Mohan Prasad
Global head API R&D
SUN PHARMA,
Gurgaon

Prof.(Dr.) Avadhesh Kumar
Pro Vice-Chancellor,
Galgotias University,
Greater Noida, UP

Our Valuable Speakers



Prof. Afrozul Haq
Vice Chancellor
HA University Imphal, Manipur

Dr. Neeraj Kumar Fuloria
AIMST University
Malaysia

Dr. Sushma Talegaonkar
DPSRU,
New Delhi

Dr. Gaurav Jain
DPSRU
New Delhi

Dr. Sadiq Umar
Translational Scientist
University of Illinois Chicago
United States

Dr. Sanchit Sharma
Director
Ayouthveda by AIMIL &
Management team member at
AIMIL Pharmaceuticals, New Delhi

Dr. Naveen Kalra
Director
Koshika Wellness Pvt. Ltd., New Delhi

Ms. Rinku Kalra
Project Management IPR
Sun Pharma, Gurgaon, Haryana

Evaluation of *In-vitro* Anti obesity activity of bioactive fraction of *Haldina cordifolia* Leaves Extract through Antioxidant and Enzyme Inhibition Assays

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Abstract:

Obesity is a chronic condition characterized by excessive body fat that affects nearly all bodily functions. Prevalence of obesity has significantly increased worldwide in recent years. While allopathic drugs are used for treating obesity, they often come with various adverse effects. Herbal medicine, which is widely used globally due to its affordability, accessibility and fewer side effects compared to allopathic medicine, may offer a potential alternative. *Haldina cordifolia*, a member of Rubiaceae family, has reported antioxidant, anti-diabetic, anti-inflammatory activities along with other therapeutic effects but its anti-obesity potential has not been explored yet. The plant contains active constituents such as β-sitosterol, stigmasterol, and epigallocatechin, already been established for targeting anti-obesity activity. Initially, cold maceration technique using methanol was used for the extraction procedure, followed by thin layer chromatography for solvent optimization and column chromatography for fraction optimization. Phytochemical analysis, anti-oxidant activities, and enzyme inhibition assays were performed, with Fraction 2 and 3 exhibiting the best IC 50 values compared to other fractions. Standard compounds for anti-obesity activity were identified through HPTLC analysis. The most potent fraction exhibited significant anti-obesity activity in various anti-oxidant and enzymatic assays. The results suggest that *Haldina cordifolia* has promising potential as a herbal remedy for obesity.

Keywords: *Haldina cordifolia*, obesity, fractions, antioxidant assays

Coffee Oil Base Nanoparticles: A Novel Approach for Targeted Drug Delivery Systems

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Abstract:

Duodenal ulcers are a common gastrointestinal disorder, caused by the excessive secretion of gastric acid in the stomach. Coffee is known to decrease the release of gastric acid, which makes it a potential candidate for the treatment of duodenal ulcers [1]. However, the use of coffee as a drug delivery system has certain limitations. To overcome these limitations, coffee oil-based nanoparticles have been developed as a novel approach for targeted drug delivery to the intestinal epithelium [2]. These nanoparticles have sustained release properties, which enable them to release the encapsulated drug over a period of several hours, improving the bioavailability and therapeutic efficacy of the drug [3]. This paper reviews the current understanding of the pathophysiology of duodenal ulcers and the role of coffee in the management of this disorder. Additionally, it discusses the potential applications of coffee oil-based nanoparticles in the treatment of duodenal ulcers, highlighting the benefits of this approach over traditional drug delivery systems.

Keywords: Coffee oil base, nanoparticles, duodenal ulcer, drug delivery

Molecular Modeling, Docking, and QSAR Studies on A Series of N-arylsulfonyl-N-2-pyridinyl-piperazines Analogs Acting as Anti-Diabetic Agents

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Abstract:

The Molecular structure of compounds contains a lot of information that can be used further. A classical Quantitative Structure Activity Relationship (QSAR) method was used to decode that information based on the descriptors. The study was performed on a mono-substituted series of Glucokinase-Glucokinase regulatory protein inhibitors (GK-GKRP/GCKR). A sequential application of the statistical method, both linear and nonlinear, has been used in the study which includes Multiple Linear Regression (MLR), Partial Least Square (PLS), and Artificial Neural Network (ANN). The developed model was validated using various statistical methods to evidently prove its reliability and precision. This knowledge will be used to design a new compound. Docking studies were performed to establish the binding pattern of the designed compound. The prophetic power and robustness of the model containing 26 compounds in the training set were proven by the various statistical parameter s value: 0.30, F-value: 41.8, r: 0.94, r2: 0.88, r2CV: 0.77. The model gives insight into the various descriptors that are selected for the present study. The present study not only shows the contribution of various substituents in the biological activity but also indicates the changes that can be done to design the new potent molecules with more selectivity and less toxicity.

Keywords: Glucokinase, glucokinase regulatory protein, multiple linear regression, partial least square, artificial neural network

A Natural Approach to Menopause

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Abstract:

Menopause is an inevitable component of ageing and encompasses the loss of ovarian reproductive function, either occurring spontaneously or secondary to other conditions. The transition to menopause, or perimenopause, is characterized by menstrual irregularities, vasomotor symptoms, sleep disturbances, mood symptoms, and atrophy of the urogenital tract. These changes can also affect quality of life and self-esteem. Hormone replacement therapy (HRT) is considered the best option to achieve therapeutic relief from various menopausal symptoms, but is usually limited to moderate or severe symptoms. In addition, many women refuse HRT for various reasons related to the fear of cancer and other side effects. According to these reflections, new themes emerge: dissatisfaction with the cost of drugs and conventional health care, the desire for personalized medicine, and the public perception that "natural is good". In this context, non-hormonal therapies are mostly developed and it is not uncommon for women to often require a "natural" approach to their symptoms. The aim of this study is to investigate non-hormonal therapies that have been found to reduce menopausal symptoms.

Keywords: Neutraceuticals, natural approach, isoflavones, supplementation, menopause symptoms

The Pervasiveness of Stomach Ulcer Induced by Stress and Other Ulcerogenic Agent

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Abstract:

Ethnopharmacological relevance: A detailed study of lethal consequence of perforated peptic ulcer (PPU), is linked to higher patient morbidity and death rates. The likelihood of acquiring PPU is considerably increased by psychological stress. Fear and uncertainty are brought on by the coronavirus disease pandemic of 2019 (COVID-19), which elevates psychological stress. Additionally, the factors impairing the mucosal resistance to damage include infection with Helicobacter pylori, non-steroidal anti-inflammatory medicines (NSAIDs). Proton pump inhibitors (PPIs) as well as histamine-2 (H2) receptor inhibitors, two common therapies for peptic ulcers, have been shown to cause side effects, relapses, and a variety of pharmacological interactions. However, medicinal plants and the chemicals they produce can be used to cure and prevent a wide range of illnesses.

Objective: To study the prevalence of peptic ulcer disease caused due to stress and other ulcerogenic agent and explain the epidemiology, risk factor and treatments.

Method: We have searched various research and review articles on PubMed, NCBI, Nutrients and science direct. Systemic review database articles from 2000 to 2023 years.

Result: According to a comprehensive study, prevalence and case study upon the demographic criteria also dealing with various modes of treatment.

Conclusion: This review depicts that risk factor, prevalence and treatment of peptic ulcer disease. Few studies related to stress which is caused peptic ulcer disease.

Keywords: Stress, peptic ulcer, covid-19, NSAIDs, psychological trauma

An Overview of Novel Methods for Herbal Microsponges Design, Formulation, and Characterization

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Abstract:
Dermatological conditions have a severe emotional impact and significantly lower patient quality of life. In the treatment of these illnesses, topical therapy is crucial. Conventional topical distribution methods lead to over- or under-dosing, which has negative consequences and lowers therapeutic efficacy. As a result, scientists have been working to create alternate delivery methods for dermatological uses. Microsponges became a popular topical administration method over the past ten years. Microsponge technology is a flexible drug delivery approach due to its many positive features. Built on microscopic, polymer-based microspheres, Microsponge Systems can suspend or entrap a variety of substances, including drugs, herbal extracts, and other substances. After that, these microspheres can be included in a prepared product, like a herbal gel, cream, liquid, or powder. It is possible for material to continuously flow out of the sphere since the outside surface is frequently porous. Porous, polymeric microspheres known as microsponges are typically used topically but have recently been used orally. This review offers fresh ideas for designing herbal microsponges as well as for characterizing, assessing, and using them.

Keywords: Herbal microsponges, topical drug delivery, polymer-based microspheres, non-allergic

Effect of Polyherbal Extract on Early Behavioral and Cognitive Impairment Symptoms of Alzheimer's Disease

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Abstract:

The most prevalent form of dementia, Alzheimer's disease (AD), affects more than 10 million individuals worldwide and is a degenerative neurological condition. Since conventional treatments only target a single molecular target but Alzheimer's disease includes a complex interplay of multiple molecular targets and signaling networks, a complete cure for this illness is still elusive. In this regard, substantial research is being done on the viability of using medication combinations to protect neurons from the dysregulated metabolic processes. As neuroprotectors cannot reverse existing damage, but they may protect against further nerve damage and slow down any degeneration of the central nervous system. Numerous herbs have been demonstrated to enhance cognitive function and may be useful in the treatment of AD. Treatment with antioxidants is a promising approach for slowing disease progression to the extent that oxidative damage may be responsible for the cognitive and functional decline observed in AD. The present work investigates a polyherbal formulation of *Amorphophallus Paeoniifollius* (Elephant foot yam) and *Withania Somnifera* (Ashwagandha) which is rich in antioxidant and has anti-neuroinflammatory and anti alpha-beta aggregatory activity which may provide symptomatic relieve in scopolamine induced dementia in wistar rats. As scopolamine induces neuro inflammation by increasing the level of oxidative stress in hippocampus which may get reversed by the given herbs. Recovery of antioxidant capacities, including reduced glutathione (GSH) content, and the activities of SOD, MDA and Acetylcholinestrse will be the evidence to the given herbal formulation treated rats.

Keywords: Alzheimer's disease, cognitive impairment, polyherbal, neuroprotectors, antioxidant activity

RP-HPLC Method Development and Validation for Simultaneous Estimation of Atorvastatin and Tadalafil

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Abstract:

A reverse phase high performance liquid chromatographic method was developed for the simultaneous estimation of Atorvastatin and Tadalafil. The method was validated according to ICH Guidelines. Preformulation studies was carried out to characterize the chemical and physical properties. The melting point of Atorvastatin and Tadalafil were found to be in range 159-161°C and 301-302°C respectively. The Method development was conducted with sapphirus C18 column (5µm, 250×4.6mm) with the flow rate of 1.2mL/min. The optimized mobile phase conditions were 0.005M phosphate buffer and Acetonitrile in the ratio of (40:60v/v). The retention time for Atorvastatin was 5.287 and for Tadalafil it was found to be 3.967.The developed method was validated for specificity, precision, linearity, accuracy, robustness, ruggedness, LOQ, LOA. So simple, sensitive, accurate, precise RP-HPLC methods were developed and validated for the simultaneous estimation of Atorvastatin and Tadalafil.

Keywords: Validation, atorvastatin, tadalafil

Advancement of Microneedle Technique in Drug Delivery and Their Application

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Abstract:

Microneedle is the new way of delivering active ingredients into the skin. By having a series of advantages like quick and efficient drug delivery, mechanical stability, minimal pain, variable capacity and easy to use. It is enabled for delivery of vaccine, peptides, medicinal components and in cosmetology which couldn't go unnoticed. This review elaborates the key features of microneedle like classification, mechanism of action, evaluation, advantages, market product and applications. It also highlights the use of different types of polymers and material for the fabrication of microneedle. Additionally, this review article putting a spot light on future scope on transdermal drug delivery system. Since from two decades microneedles have been used for a drug delivery. These approaches in the transdermal drug delivery system have been increase the efficiency of drug delivery into the skin by crossing the skin barriers. This platform has wide range of application like it can also be use to deliver non-transdermal biomedicals. The variety in the design of MNs has demanded similar diversity in their methods of fabrication; micro molding and drawing lithography are the very useful methods. Several synthetic and natural martials are used in the fabrication of microneedles. Unique shapes, materials, and mechanical properties are modified for organ-specific application in microneedle engineering. In this review, we discuss the several factors that aim to cross the biological barrier for transdermal drug delivery in various site such as in ocular, vascular, oral, and mucosal tissue.

Keywords: Microneedle, mechanical stability, minimal pain, variable capacity, quick efficient

Design, Implementation, and Outcomes of the Pharmacist-led Lipid Clinic in a Tertiary Care Teaching Hospital

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Abstract:

Background: Despite various guidelines for the management of dyslipidemia, its prevalence is increasing in India.
Objectives: To design, implement, & evaluate outcomes of a pharmacist-led lipid clinic in a tertiary care teaching hospital.
Methodology: First, a pharmacist surveyed the patients and healthcare professionals to discover the problems associated with dyslipidemia management. A randomized controlled trial was conducted to evaluate the outcome (CTRI/2020/12/030065). Pharmacist interventions include education and therapy modifications. The primary outcome was the LDL cholesterol; the secondary outcomes were medication adherence and quality of life.
Results: It is surprising that only 38.61% of healthcare professionals surveyed know about the Lipid Association of India expert consensus statement on the management of dyslipidemia in Indians. Patient forgetfulness (66.67%) followed by the low education level of the patient (61.90%), High cost of the drugs (42.86%), and side effects of the treatment (42.86%) are the common reasons for non-compliance to the dyslipidemia therapy. The intervention group (N=186) achieved a 10.23% and 24.42% mean reduction in LDL-C in 1st and 2nd follow-ups, respectively, from baseline compared with 5.69% and 17.04% in the control group (N=192), respectively ($P<0.05$).
Conclusion: A pharmacist-led lipid clinic has demonstrated a positive impact on managing dyslipidemia.

Keywords: Hyperlipidemia, clinical pharmacist, LDL, clinic

Niosomes: A Potentially Useful Nanocarrier for Drugs

Akash Garg*, Chetan Singh Chauhan

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Abstract:

Major strides have been made in the field of nanocarrier-based medicinal delivery over the course of the last several decades and research on niosomes has garnered a lot of attention as of late. Niosomes are formed due to the self-assembly of vesicles made of nonionic surfactant. Niosomes are the most current kind of nanocarrier. They are self-assembled vesicles that are formed of nonionic surfactants and may or may not contain enough amounts of cholesterol or other amphiphilic compounds. Niosomes are gaining popularity as a result of the fact that they are long-lasting, their component costs are minimal, they can be manufactured in huge quantities, easy maintenance, and they have a high entrapment efficiency. In addition to this, they improve pharmacokinetics, lower toxicity, improve the solubility of chemicals that are weakly water-soluble, and raise bioavailability. Niosomes' capacity for controlled release and targeted diffusion is one of their most important properties, as it enables them to be used in the treatment of a wide variety of conditions, including cancer, infectious disorders, and other issues.

Keywords: Nanocarrier, niosome, nonionic surfactant, targeted delivery, cancer

A Review on Polymeric Micelles as Nanocarrier for Drug Delivery

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Abstract:

Micelles are nanometer-sized aggregates produced by the self-assembly of amphiphilic polymers in aqueous solution. Micelles serve as an effective carrier for hydrophobic components because they possess both a hydrophobic core and a hydrophilic shell. Micelles act as conveyance vehicle for active pharmaceutical ingredients and transport them to their intended targets throughout the body while shielding them from the unfavourable physiological environment and improving pharmacokinetic features, which in turn improve pharmacological and toxicological profiles. The nano size structure, good association, low toxicity, biocompatible and high stability of micelles make it simple and favoured for the delivery of hydrophobic pharmaceuticals. Polymeric Micelles are a flexible substitute for micellar drug delivery systems and have superior properties when compared to other micellar systems. Drugs, proteins, peptides, DNA, SiRNA & other pay loads can all be delivered using micelle-based delivery system due to their exceptional flexibility. Dose of drug can be reduced which will improve safety by the modification of micelle components to achieve biological target selectivity. Our main goal is to present a timely update on polymeric micelles while emphasizing applications and key factors that have contributed to the successful delivery of medications to their sites of action.

Keywords: Micelles, drug delivery, hydrophobic, hydrophilic, solubility

Enhancement of Bioavailability Efavirenz by Solid Dispersion Technique Using Sugar Based Carriers

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Abstract:

The objective of the research work is to enhance the bioavailability of efavirenz (EFZ) by solid dispersion using various concentrations of sugar carriers like lactulose, xylitol, sorbitol and soluplus. First the drug was subjected to determine bulk density, Carr's index, Hausner's ratio, angle of repose, solubility analysis in various solvents like 0.1 N HCl, 6.8pH, 7.2 pH phosphate buffers, methanol, and ethanol. Simvastatin solid dispersion was prepared using different concentrations (1:0.5, 1:1, 1:1.5, 1:2) of carriers by using the solvent evaporation method. All the formulations were subjected to determine various physiochemical properties. All the formulations were found within the permissible pharmacopoeial limits for various physicochemical parameters. The preformulation studies, like FT-IR, showed the absence of drug-excipient interactions. EFZ exhibited better solubility in 7.4 pH phosphate buffer than remaining solvents. The formulations were evaluated for % yield, entrapment efficiency, *in vitro* drug release studies. Recovery rates ranged from 88 to 100 % and capture efficiencies ranged from 94 to 100%. Although formulations containing xylitol as a carrier released 85-99% of the drug, formulations containing sorbitol as a carrier released 78-98% of the drug, and formulations containing lactulose showed 95-100% of drug release. The formulation containing soluplus released 85-99% of the drug release for more than 60 min.

Keywords: Efavirenz, soluplus, xylitol, lactulose, sorbitol

Comparing the Efficiency of Written and Audio-visual Aids on Imparting Knowledge About Diabetic Foot Ulcer to Patients

Barma Naga Raju[1]*, Uday Venkat Mateti[1], Rajashekar Mohan[2,3], Caren D'Souza[2], C. S. Shastry

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Abstract:

The study aims to compare the communicative efficiency of written PIL with audio-visual aids. PILs and educational videos were developed with inputs from peer reviewed articles and international guidelines and validated by experts in healthcare, based on the content validity index. PIL readability was assessed by Flesch reading ease (FRE) and Flesch-Kincaid grade level (FKGL) tools. The design and layout of the PIL were evaluated using the Baker Able Leaflet Design (BALD). The user opinion on the design and content of the PILs and educational videos were obtained with the help of questionnaires. The FRE and FKGL scores of the PIL were 81.4 and 6.1, respectively. The BALD scores of the English, Kannada and Malayalam language PILs were 27, 28, and 26, respectively. The overall user-testing knowledge mean score of the PILs and videos significantly improved from 45.5±11.26 to 69.33±9.18 (p-<0.001) and 46±15.20 to 84.33±9.08 (p-<0.001), respectively. The overall user opinion was good for both the PIL [n=54 (90%)] and video [n=55 (91.67%)]. The study's results showed a notable improvement in the degree of knowledge among the DFU patients after reading the PIL and watching the video. The education tool video had a higher impact on knowledge levels than PIL.

Keywords: Diabetic foot ulcer, patient information leaflet, educational video, validation, readability

Docking Studies of Novel Imidazole Derivatives against PPAR- γ as Antidiabetic

Anila Mishra[1]*, Zeeshan Fatima[1], Akash Ved[2], Sajal Srivastava[1]

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Abstract:

Diabetes is a chronic disease that occurs either when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin it produces. Decreased glucose tolerance and diabetes are related to insulin resistance. Peroxisome proliferator-activated receptor (PPAR) belongs to the superfamily of a phylogenetically related protein named as nuclear hormone factor. PPAR-γ has a place with the group of PPAR which assume a basic part to regulate energy storage and its expression is in endothelial cells PPAR-γ activates some genes in tissues that results in an increase in glucose and lipid uptake, decreases free fatty acid concentration, and subsequently decreases the insulin resistance. Molecular docking is an effective tool for investigating ligand-receptor interactions and for virtual screening, which plays a key role in rational drug design. Here, we describe the design, synthesis, and screening of a new series of Imidazole derivatives using molecular docking studies with the help of some software. Our efforts are dedicated to obtaining imidazole containing analogues having the affinity for PPAR-γ receptor as antidiabetics.

Keywords: PPAR-γ, imidazole derivatives, diabetes, insulin resistance, modern drug technology

Nephrotoxins

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Abstract:

The harmful impact of substance on renal function is known as nephrotoxicity and the substance show harmful impact called nephrotoxins. Nephrotoxins can be classified in various categories like drugs as nephrotoxins, plant origin nephrotoxins, environmental toxins, dietary supplements as nephrotoxins, mycotoxins, pesticides and some infection causing agents act as nephrotoxins. Drugs like cisplatin and aminoglycosides, plants like lemongrass, liquorice, pesticides like alachlor, atrazine, environmental toxins like heavy metals, halogenated aliphatic hydrocarbons and aromatic halides, mycotoxins like citrinin are the examples of nephrotoxins. The various mechanism by which they can cause nephrotoxicity are inflammation, tubular cell necrosis (drug induced), hemolysis, vasoconstriction (plant induced), oxidative stress, enhanced permeability, encephalopathy (environmental toxins), cysts formation, nephrolithiasis (by dietary supplements), tubular epithelial degeneration, vascular congestion (pesticides induced) endothelial cell damage, hypertrophy of tubular cell, increased vascular permeability (infection agents induced) etc. Abstract summarized the main class of nephrotoxins supported by specific examples with their mechanism of actions.

Keywords: Kidney injury, nephrotoxins, nephrotoxicity, oxidative stress, environmental toxin

Role of Artificial Intelligence in Drug Product Development

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Abstract:

The era of artificial intelligence is now. AI has impacted almost every industry, and the pharmaceutical sector is no exception. AI has the potential to significantly enhance and optimize the drug development process. AI, which stands for artificial intelligence, is used to describe systems or machines that mimic human intelligence in order to carry out tasks. AI is being used to transform the drug discovery and development process by ultimately making it more efficient and less expensive. The discovery phase is significantly shortened by AI's identification of therapeutic targets and optimization of drug candidates, which also strengthens the justification for selection of targeted drug candidates and lowers failure rate. AI can streamline design processes, perform quality control, and, in general, improve the manufacturing process. AI is playing a role in drug identification and validation, target - based, phenotypic as well as multi-target discoveries. Artificial intelligence (AI) has the potential to significantly increase productivity, efficiency, and drug production rates across the board. The pharmaceutical industry is only just beginning to use artificial intelligence, but the advantages are already apparent. With more advancement, AI may change how medicines are created and prescribed, ultimately improve patient outcome.

Keywords: Drug discovery, artificial intelligence, optimization

A Stability Research Investigation on the Effects of Simulated Microgravity on Nanoparticle

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Abstract:

During the space travel mission, astronauts' physiological and psychological behavior will alter, and they will start consuming the terrestrial drug product. Despite microgravity, radiation exposure, rapid changes in temperature and humidity, strong vibrations, dense vacuum, and other issues encountered, the drug product undergoes physicochemical changes. It will ultimately impact the shelf life and diminish the Pharmacokinetic and Pharmacodynamic profile of the drug product when API and inactive ingredient are exposed to the space environment, leading to changes in the structure of the compound. Consequently, these changes in the physical and chemical properties will produce a loss of potency and the formation of toxic degradation products. Similarly, it will affect the excipient, which reduces the activity of the excipient, and the formation degradation product will influence the potential of the drug substance. In these states, novel formulation strategies play a crucial role in preventing the formation of impurities, degradant products, and potential loss of drug substances. Nano-sized drug delivery can control the drug from hydrolytic and enzymatic degradation. It will also provide stability to the photolabile drugs, exhibiting significantly less photodegradation over radiation exposure. The pharmacokinetic and pharmacodynamic analogs of non-clinical studies can also be evaluated using rodent hind limb suspension analog studies.

Keywords: Nanoparticle, microgravity, pharmacokinetic, stability, clinostat-3d, pharmacodynamic

Gastroretentive Drug Delivery System: An Approach to Improve Patient Compliance

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Abstract:

Many efforts have been made to improve oral drug bioavailability, therapeutic efficacy and patient compliance. Array of controlled-release oral drug delivery systems have been developed to meet these needs. Subsequent absorption in the stomach or proximal small intestine can be improved by formulating gastroretentive drug delivery system that have potential to achieve retention of the dosage form in the upper gastrointestinal tract (GIT) and that can be sufficient to ensure complete solubilisation of the drugs in the stomach fluid. Prolonged residence time in the stomach with controlled release formulation can be of great practical importance for drugs with a narrow absorption window in the upper small intestine. Medical treatment by mans of drug that are unstable in the intestinal fluid or drugs that exhibit poor solubility in the intestinal fluid, could also be greatly improved if delivered with prolonged gastric residence time in the stomach. Various strategies to prolong gastric residence time have been developed. These are floating (low density) and nonfloating drug delivery system both these system are fabricated by the inclusion of polymers which prolong gastric residence time by various mechanism and increase biological action of drug in the body.

Keywords: Stomach, gastric retention, gastroretentive drug delivery systems, controlled release, patient compliance

Chromatographic Studies of *Aporosa lindleyana* Root Extract

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Abstract:

Aporosa lindleyana is an evergreen tree of family euphorbiaceae. Traditionally used to treat headache, fever, diabetes and liver disease.The present work aims to perform Chromatographic Analysis of *Aporosa lindleyana* root extract. The morphological and physico-chemical parameter was carried out. The dried and powdered *Aporosa lindleyana* root extracted using different solvents by successive solvent extraction method based on polarity of solvents. The extracts subjected to preliminary phytochemical screening. TLC, GC-MS analysis was performed. Percentage yield of successive solvents extraction calculated. Preliminary phytochemical screening of plant extracts revealed the presence of differentcompounds. A Pharmacognostical study on Root including phyisico-chemical parameters was carried out. Maximum yield of the extract was found. TLC, GC-MS of the extract was carried to get the total composition of the extracts, HPTLC studies were carried out for the estimation of the different components of *Aporosa lindleyana* root extract. This study showed that the root extract of *Aporosa lindleyana* is found to contain phenolic and flavonoids reported to have rich antioxidants activity. The Chromatographic studies also supported the Pharmacognostical parameters. The phytochemicals study can be attributed to the different activities. Therefore, this study validates the Root extract of *Aporosa lindleyana* with excellent sources of potent bioactive compounds.

Keywords: Extraction**,** chemical screening, chromatographic studies, herbal drug

Exploration of Biopolymers in Developing Pharmaceutical Dosage Forms: A Review

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Abstract:

Particularly in recent years, the medical community, scientists, and industry have shown a keen interest in research on the application of biopolymers. Biopolymers are substances made with the help of numerous living things, including plants. Polymeric substances called biopolymers are produced from biological sources. They have been researched for several industrial applications, including sorption, because of their renewability, abundance, biodegradability, and other distinctive qualities like high adsorption capacities and simplicity of functionalization. Biopolymers are the ideal material for our review because of their low toxicity, stability, renewable nature, and biodegradability. It is one of the most widely used substances in the world and are frequently made of organic substances. Natural materials are becoming more popular in the medical and pharmaceutical sectors due to their biodegradability and resorb ability. The review examines the challenges and limitations of integrating host biological and metabolic parameters with polymer-derived materials that can be used in the development of new applications and provides evidence in support of studies looking at the use of biopolymers in the creation of novel drug delivery systems. In recent years, biopolymers have been extensively researched and used in pharmaceutical formulation development. The biopolymers are therefore non-toxic, cost-effective, biodegradable, and widely available.

Keywords: Biopolymer, non-toxic, biodegradable

Rationale Design of Polyamine-Conjugated Novel Antimicrobial Peptidomimetics Against Multidrug Resistant Methicillin Resistant *S. aureus* with high Cell Selectivity

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Abstract

Cationic antimicrobial peptides are promising antibiotics against resistant microbes because they exhibit broad spectrum antimicrobial activity with membrane active mode of action therefore does not easily induce resistance. Towards design of therapeutically viable antimicrobials, we employed spermine as a charge template and the secondary amino groups of spermine were conjugated with different amino acids residues and halogenated acids. We synthesized a focused library and successfully identified two peptidomimetics among them as potent antibacterial agents against methicillin resistant *S. aureus* and MDR-MRSA and MRSE with MICs in range of concentrations 1.5- 6.2 µg/mL. Selectivity index of the peptides was found to be considerable as therapeutics. It was not showing any toxicity against hRBCs and THP-1 (monocytes, primary cells of the human cells) at >200µg/mL. These two peptidomimetics were showing membrane disrupting behavior against the bacterial mimetic liposomes and live MRSA. Moreover, these compounds were also demonstrated the *in-vitro* anti-inflammatory activity against the LPS induced inflammations. Due to the introduction of non-peptide moiety and ultra-short structure, these peptidomimetics are potential antibacterial agents against the infection of MRSA. In future, to evaluate the efficacy of these molecules, *in vivo* studies can be performed in MRSA infected wound models in rodents.

Keywords: Drug resistance, polyamine, spermine, antimicrobial peptides, MRSA, peptide synthesis

Plumbagin - An Alternative Treatment for Oral Cancer – Can it be a Reality?

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Abstract:

Introduction: Cancer is a deadly disease affecting 185 countries with about 10 million deaths worldwide. Barring high-cost, modern cancer treatment and allopathic medicines is a double edged sword because of side effects which is a major concern to worry about; therefore, the time has come to look for plant-based herbal treatment like plumbagin. It is pertinent to mention that only a few *in-vitro* studies and *in-vivo* studies have been conducted to prove its anticancer potential in oral cancer.

Objectives: To enlighten the role of Plumbagin in the treatment of different types of cancer of the body, to highlight the much-needed plant extract Plumbagin for oral cancer treatment, to focus on the documentation of research on Plumbagin and to encourage further research on medicinal plants that result in the discovery of potent anti-cancer agent.

Methodology: Google-scholar, PubMed, EBSCO and Scopus databases. Data was collected by electronic and manual search. The articles were scrutinized carefully and those which were not relevant to our search were omitted. The data was compiled depicting the role of Plumbagin in different types of cancer and cancer cell lines in general and oral cancer in particular.

Results: *In-vitro* studies of plumbagin conducted have shown anti-oncogenic properties in Oral Cancer cell lines. The results of *in-vitro* studies will be presented here.

Conclusion: Plant-based medicines are being increasingly recognized as useful complementary treatments for cancer as they are most suited, safe, cost-effective, easily biodegradable with no significant side effects. Plumbagin is one such phytocompound that has immense anti-oncogenic medicinal and therapeutic properties. There is an urgent need to do more studies on this novel drug for oral-cancer. Additionally, clinical studies are also required for the evolution of plumbagin and its applications as a novel drug for the treatment of cancer.

Keywords: Plumbagin, medicinal plants, oral cancer, oncogenic properties

Disposal of Expired and Unused Medicines

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Abstract:

Pharmaceutical products contain biologically active substances which may adversely impact the ecosystem if disposed of inappropriately. The inappropriate waste disposal and handling of pharmaceuticals throughout their lifecycle (from production to disposal) can have severe consequences for public health, aquatic and terrestrial flora and fauna and also responsible for increase in antimicrobial resistance cases. The most common approach for disposing of unused, leftover, and expired pharmaceuticals was to throw them away as domestic waste. According to Indian Pharmaceutical Association, in 2019, the domestic industry is worth around 1.2 lakh crore and every year and the sector receives stock that is damaged or expired worth between Rs 3300 and Rs 5500 crore. In USA the value of unused pharmaceuticals produced by just the elderly population in the US is projected to be over USD $1 billion annually, according to a cross-sectional study done in 2001. Some nations have stringent guidelines on pharmaceutical waste, and many nations are already drafting laws and regulations for pharmaceutical waste treatment and disposal. This article also discusses the guidelines and regulations related to disposal of expired and unused medicines in India and USA.

Keywords: Expired drugs, unused medicines, disposal of drugs, regulation related to disposal of drugs

Development of Male Contraceptive Pills

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Abstract:

Unplanned pregnancies are an ongoing global burden, posing health and economic risks for women, children, and families. About 70% of contraceptives are used by women, some women are unable to use them because of health issues or side effects. Only two reliable methods of male contraception are condoms and vasectomy. Use of an effective contraceptive reduces abortion rates, and also results in improvements in newborn and maternal health from better child spacing. As a result, efforts are being made to create new male contraceptives that are comparable to common female techniques including daily pills, long-acting injections, and implants. In many men, effective suppression of spermatogenesis can be achieved by androgen-progestin combination therapy. In a study supported by the US Government, researchers have been looking at a novel male contraceptive pill that has been dubbed a "game-changer." The outcomes, which were made public in February 2023, were incredibly encouraging. The medication achieves this by specifically targeting adenylyl cyclase, an enzyme that allows sperm to go through the female reproductive system and fertilize an egg. The medication is administered 30 minutes before sex and prevented pregnancy for at least two hours. It prevents male sperm from reaching to the reproductive system where it can fertilize an egg.

Keywords: Spermatogenesis, contraceptives, androgen, progestin, adenylyl cyclase

Diabetic Retinopathy: Current Understanding, Mechanisms and Treatment

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Abstract:

Diabetic retinopathy (DR) causes significant visual loss on a global scale. DR generally seen in people above 40 years of age due to uncontrolled level of blood sugar. Symptoms of this disease are spots or dark strings floating in vision and high sugar level can lead to the blockage of the blood vessels that nourish the retina. As a result, eyes attempt to develop new blood vessels and these new blood vessels don't develop properly and can leak easily. Vascular leakage caused by the breakdown of the blood retinal barrier (BRB) is the main event involved in the pathogenesis of DME. Proliferative diabetic retinopathy (PDR) and Diabetic macular edema (DME) are important event that occurs in diabetic retinopathy. Treatment of this disease are tight control of both blood glucose levels and hypertension to prevent or arrest progression of the disease, the recommended goals are difficult to achieve in many patients and, consequently, diabetic retinopathy develops during the evolution of the disease. Anti- VEGE medication like Avastin, Eylea and lucentis used in the treatment of DR. Anti- VEGE help to reduce swelling of the macula. One more option of the diabetic retinopathy treatment is laser surgery might be used to help seal off leaking blood vessels.

Keywords: Diabetic retinopathy, proliferative diabetic retinopathy, diabetic macular edema

Herbal Treatment of Alzheimer's Disease

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Abstract:

Alzheimer's disease, the most common cause of dementia, is *a progressive neurodegenerative disorder that causes the brain to shrink and brain cells to die.* At present, 47 million people are suffering from dementia globally, and it is estimated to increase more than threefold (~131 million) by 2050. The main characteristics of Alzheimer's disease are loss of memory, inability to learn new information, mood swings, and inability to complete activities of daily living. The two prominent pathologic hallmarks of Alzheimer's disease are (a) extracellular accumulation of β-amyloid deposits the disease process is most likely to be: β-amyloid deposition → tau phosphorylation and tangle formation → neuronal death and (b) intracellular neurofibrillary tangles. Some allopathic medicine used in Alzheimer like AchE inhibitors (Donepezil, Rivastigmine) and NMDA receptor blockers (Memantine) but these drugs have some side effects like nausea, vomiting, headache, constipation etc. Ashwagandha, brahmi, turmeric and saffron used in the treatment of Alzheimer's disease. As the disorder requires a long-term treatment with frequent dosing, this may produce adverse effect with allopathic medicine. There is need to develop the safer and effective drugs. There are various benefits of herbal treatment as compared to allopathic treatment for example Reduced side effect increase savings, self-healing.

Keywords: Alzheimer's, herbs, AchE inhibitors, dementia, NMDA receptors

Complications in Ulcerative Colitis

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Abstract:

Ulcerative colitis is an idiopathic, chronic, inflammatory disease condition involving ulcers and inflammation in colon area without skip. The inflammation starts from rectum goes upward in sigmoid colon without skip area. It is characterized by recurrent attacks of bloody diarrhoea, mucous discharge urgency for stool etc may also present with Anaemia. Various risk factors including age, gender, race, genetics, smoking, diet, microbiota, appendectomy plays an important role in the genesis of colitis. The complications in ulcerative colitis are intestinal and extra intestinal. The intestinal complications includes Bleeding (frequent cause of iron-deficiency anaemia), Toxic megacolon (severe colonic distention 6 cm or more accompanied by fever, pain, tenderness), Stricture, Dysplasia, Colorectal cancer (may be multifocal and arise in flat lesions) Extra intestinal complications includes musculoskeletal system(Peripheral arthritis: most commonly migratory, non-destructive arthritis of large joints), skin complications(Erythema nodosum, pyoderma gangrenosum, oral ulcers), Ocular condition (Most common in the anterior chamber: episcleritis, scleritis, uveitis, iritis, conjunctivitis) , Hematopoietic(Anaemia of chronic diseases, iron-deficiency anaemia, anaemia of mixed origin), Coagulation system complications(Clotting abnormalities, abnormal fibrinolysis, Thrombocytosis, Endothelial abnormalities; Thromboembolic events, particularly in peripheral veins).

Keywords: Ulcerative colitis, musculoskeletal, haematopoiesis

Formulation and Evaluation of Polymer Matrix Transdermal Patch Incorporating Microemulsion

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Abstract:

Topical delivery, often known as transdermal distribution, is a method of administering medication through the skin or shielding it from metabolism. The topical formulations come in a variety of forms, including creams, lotions, patches, gels, and ointments. The transdermal patches are the mechanism by which the medication diffuses from the polymer matrix, permeates the skin, and provides the patient with a therapeutic benefit. The unique delivery method used by microemulsion patches allows for easier skin penetration of the medicine, which makes it more effective than standard patches at delivering medication. The medication is contained in a dispersed phase of the thermodynamically stable biphasic microemulsions, which are seen as a clear solution and used as a delivery system for the dosage. For determining its efficacy, techniques including entrapment efficiency and *in vitro* drug release testing are available. A number of characterization experiments have been carried out, including those on electro conductivity, rheological characteristics, centrifugation, folding endurance, surface pH, water content, and stability. In comparison to conventional patches or topical formulations, the microemulsion patch drug delivery system has been found to have a longer bioavailability and duration of action.

Keywords: Microemulsion, topical drug delivery, transdermal patch, *In vitro* drug diffusion, stability studies

Exploring the Benefits of Combinational Therapy of Bupropion HCl and Piperine for the Treatment of Depression

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Abstract:

Depression is a mood disorder referred to as the collection of conditions connected with the elevation or lowering of the mood marked by melancholy, loss of interest in activities, and little or no social life. Despite the enormous amount of research, efficient treatment of depression is still one of the most desired aspects of managing depression. So, this review is aimed to explore the potential benefits of combinational therapy of Bupropion HCl and Piperine for the treatment of depression. Bupropion HCl is a dual reuptake inhibitor of norepinephrine & dopamine and does not involve any serotonergic effect. At the same time, several studies have their interpretation regarding the antidepressant action of Piperine. It is supposed to act as a monoamine oxidase inhibitor, a dual regulator of serotonergic & dopaminergic systems, increase BDNF expression in the hippocampus, an activator of 5-HT1A and 5-HT1B receptors, neuroprotective. This combination is supposed to act as a neuroprotective, reuptake inhibitor of norepinephrine, dopamine, and serotonin. Thus, this combination is supposed to act in a miscellaneous manner due to the ambiguous mechanism of action of Piperine and may prove to be helpful for the treatment of depression.

Keywords: Depression, combinational therapy, piperine, Bupropion HCl

Design and Development of 3,4 Hydroxycinnamic Acid Analogues for Sickle Cell Disease Treatment

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Abstract:

The aim of this study was to systematically review the literature for scientific information on hydroxycinnamic acid and give better treatment of sickle cell disease as 3,4 Hydroxycinnamic acid derivatives (HCAs) are a group of naturally occurring polyphenolic compounds which possess various pharmacological activities as it has reported antisickling activity. In this work, the interactions of 2HbS (Hemoglobin S) with 8 derivatives of HCA have been investigated by Molecular docking methods. In an effort to develop potent anti polymerizing drugs with better antisickling activity, a series of new hydroxycinnamic acid analogs were designed on the basis of docked against protein using online tools and software's. Docking studies of analogs designed by substituting different chemical groups on the hydroxybenzaldehye ring at meta positions shows the ligand with the 5-methyl nicotinate as substituent in different position of hydroxybenzaldehyde of 3,4 hydroxycinnamic acid shows good binding affinity of -10.4 kcal/mol towards active site of protein. These studies may pave a new way for better treatment.

Keywords: Hydroxycinnamic acid, sickle cell disease, polyphenolic compound, molecular docking

Protective Effect of Flavonoid in 3 NPA Induced Experimental Animal Model of HD Phenotype via Regulating Nrf2/ Nf-kb Signaling Pathway

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Abstract:

Protective effect of Flavonoid in 3 NPA induced experimental animal model of HD phenotype via regulating Nrf2/ Nf-kb signaling pathway. Huntington's disease is a progressive, autosomal dominant neurodegenerative disease which progressively effect brain cell entire over time lead to progressive loss of physical and cognitive abilities. The common pathological cascade of Huntington's disease (HD)is transcription dysregulation, mitochondrial dysfunction, excitotoxicity, dysfunctional synapses, and oxidative stress. This study was conducted to investigate the beneficial role of Flavonoid (naringin) on 3 NPA induced neurotoxicity in HD experimental rat model. 3 NPA (10 mg/kg body weight (b.w.) was administered intraperitoneally (i.p.) for 21 days. Naringin was administered orally (20, 50 and 100 mg/kg b.w.) with i.p. administration of 3 NPA. One additional standard drug (NMDA antagonist) is also administered as control drug. Body weight and behavioural parameters (Actophotometer, rotarod, open field, grip strength and narrow beam activity) were assessed on the 0, 1st, 7th, and 21st day post-3-NP administration. Lipid peroxidase, nitrite concentration, endogenous antioxidant enzymes (superoxide dismutase and catalase levels), Nrf2, mitochondrial enzyme complexes (1st, 2nd, and 4th), pro-inflammatory compounds (TNF-a, IL-6, NF-kB), and caspase-3 activity were measured on day 22 in the striatum. 3 NPA administration significantly reduced body weight, locomotor activity, oxidative defence, mitochondrial enzyme complex activities and increased TNF-a, IL-6, caspase-3 activity, and NF-kB levels in the striatum. Treatment with naringin attenuated the impairment in behavioural, biochemical, and mitochondrial, pro-inflammatory and pro-apoptotic markers as compared with vehicle-treated group. All these changes were supported by histopathological observations. These findings demonstrate that naringin exerts a neuroprotective effect against oxidative stress in 3 NPA induced HD rat model.

Keywords: Naringin, 3 NPA, Huntington's disease, neurodegeneration, oxidative stress

Self-Emulsifying Drug Delivery System: Formulation, Optimization and *In-vitro* Characterization of a BCS Class-II Drug

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Abstract:

The objective of this research was to formulate and optimize a self-emulsifying drug delivery system (SEDDS) to increase the solubility of selected BCS class II drug. The solubility of selected BCS class II drug was determined in different surfactants, oils and cosurfactants. Drug compatibility studies were carried out between selected drug and certain excipients to identify any interaction. Two combinations were selected on the basis of phase solubility and compatibility studies to create ternary phase diagrams. Ternary phase diagrams were created to identify the range of concentration of excipients with higher microemulsion region. By incorporating selected excipients and drug, self-emulsifying formulation was prepared. To achieve the best formulation D-optimal mixture design was used. The optimized SEDDS formulation was evaluated for globule size, zeta potential, drug release, drug content, self- emulsification time, and stability studies. A significant improvement in *in-vitro* drug release was observed from drug-loaded-SEDDS. SEDDS may significantly increase reproducibility and bioavailability for drugs that are poorly water soluble. Hence, it can be concluded that SEDDS can offer a reproducible and stable formulation, and having better bioavailability. The study demonstrates the potential advantages of SEDDS.

Keywords: SEDDS, BCS class II drug, bioavailability, solubility

GC-MS Analysis of Bioactive Compounds from the Whole Plant Methanolic Extract of *Cynodon dactylon*(L.) Pers.

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Abstract:

Plants have been an important source of medicine with qualities for thousands of years. *Cynodon dactylon* (L.) Pers commonly known as Bermuda grass belongs to the family poaceae. In ethnomedicinal practices, the plant *Cynodon dactylon* used in the treatment of various diseases and has pharmacological actions. The present study was carried to identify the phyto-components present in the methanolic extract of *Cynodon dactylon* (L.) Pers by GC-MS analysis to ascertain its usage by the local community as a plant possessing medicinal properties. Total 68 compounds were identified. The major constituents were furfural (2.33%), 3-aminopyrazine 1- oxide, levoglucosenone (1.39%), tetrapentacontane (2.47%), 9-octadecanoic acid (2.27%), n-hexadecanoic acid (7.5%), Neophytadiene(1.30%) and benzene propanoic acid (1.91%). These findings support the traditional use of *Cynodon dactylon* in various disorders.

Keywords: GC-MS analysis, bioactive compound, methanolic extract**,** *Cynodon dactylon*

Artificial Intelligence in Drug Discovery: Applications, Challenges and Opportunities

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Abstract:

Artificial intelligence (AI) has the potential to revolutionize the drug discovery process, from target identification to clinical trials. By leveraging machine learning, natural language processing, and other AI techniques, researchers can sift through vast amounts of data to identify promising drug candidates and optimize drug design. In this paper, we review the current state of AI in drug discovery, including its applications, challenges, and opportunities. We discuss the different stages of the drug discovery process where AI is being used, from target identification to clinical trial design. We also examine the challenges associated with using AI in drug discovery, including issues related to novice youth, data quality and bias. Finally, we explore some of the emerging trends and future directions for the use of AI in drug discovery, including the potential for combining AI with other technologies such as CRISPR and machine learning. Overall, we find that AI has the potential to significantly accelerate the drug discovery process, but that there are still many challenges to be overcome before AI can be fully integrated into the drug discovery pipeline.

Keywords: Artificial intelligence, drug discovery, machine learning

Recent Research Scenario in Nano formulation Approaches for Dermal Therapeutics

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Abstract:

Dermal therapeutics covers the treatment and prevention of a wide range of skin disorders like psoriasis, acne, keratosis pilaris, and inflammatory diseases like Fox-Fordyce, contact dermatitis and skin cancer. But due to the limitations of the conventional dosage form the novel dosage form comprising Nano formulations are used. Nano-formulations have the capability to increase the penetration of active ingredients by increasing their permeation through the stratum corneum to enable the drug to reach into deeper layers. Due to the advancement in research methodologies along with time, the scope of nano-formulations in dermal therapeutics is increasing. Several developments have been made to increase bioavailability and minimize the adverse effects. Commonly employed dermal novel formulations are nano-emulsions, solid-liquid nano-particles, polymeric nano-particles, and micro-emulsions in which the drug is encapsulated for sustained release and to reduce the amount of drug required. The drug from these nano-formulations can get to the underlying skin layer for intended topical action and may permeate to other sublayers to reach the blood vessels of the dermis for intended transdermal action. Recently, nano-formulations in skin cancer treatment have become an important topic of interest for researchers. Further, these formulations are being developed for anti-acne, anti-fungal, anti-biotic, local anesthetic activity, and anti-inflammatory activity.

Keywords: Nano-formulations, dermal therapeutics, permeation, transdermal, anesthetic

Formulation of Simvastatin Loaded Pharmacosomes Transdermal Patches for Treating Hyperlipidemia

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Abstract:

The aim of the study is to evaluate anti-hyperlipidemic activity using Simvastatin loaded pharmacosomes transdermal patches in Albino wistar rats. The goal of this research is to prove the therapeutic response and to enhance the bioavailability of novel Simvastatin loaded pharmacosmes transdermal patch when compared with pure drug. Simvastatin comes under the class of BCS-II which has low solubility and high permeability. Generally, simvastatin, when given in tablet form through the oral route, shows bioavailability of less than 5%. The transdermal drug delivery is the most preferred in research area because of its advantages, and it provides a constant supply of medication through the skin into systemic circulation. The *in vivo* Antihyperlipidemic activity [Total Cholesterol (TC in mg/dl), Low Density Lipid (LDL in mg/dl), and High-Density Lipid (HDL in mg/dl)] for Simvastatin loaded transdermal patch vs. Simvastatin loaded pharmacosomes transdermal patch was performed by using commercial lipid assay kits. The statistically significant difference between the treatment's groups were carried out by one way ANOVA by using Prism software version 7. Through obtained results it is concluded that pharmacosomes is a promising carrier for encapsulating simvastatin.

Keywords: Simvastatin, carrier system, permeation enhancers, transdermal patches, bioavailability

Controlled Release Matrix Formulation of Paliperidone in Concurrence with Regulatory Requirements

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Abstract:

Atypical antipsychotic agents Paliperidone (9- hydroxy risperidone), commercial product Invega is a tri-layer longitudinally compressed tablet that is based on an advanced osmotic delivery system, designed to deliver the it in a controlled manner over 24 hours. This study is to develop a generic controlled-release single-layer matrix tablet of Paliperidone. Different combinations of Polyox and Hypromellose in the core followed by coating were adopted, which is easy to manufacture, stable, and robust formulation. Other formulation strengths are designed in such a way that these comply with the regulatory requirements of biowaiver. ICH guidelines are consequence of the harmonisation process and valid for both US & Europe regions. Furthermore, freeze formulation was assessed for nitrosamine risk assessment as well as challenge for alcohol dose dumping study. The formulation composition of bioequivalence strength was tested in recommended dissolution media as well as discriminating media pH 2.75 buffer with the reference drug product Invega. Formulation withstands 0 -40 % alcoholic conditions under *in-vitro* release tests. The formulation is stable at accelerated as well as long-term conditions. The manufacturing process involves dry blending followed by compression and coating so in short there will be the least chemical interaction of an active substance with other excipients. As a result, there is a negligible possibility to generate Nitrosamine impurity in the formulation. The formulation is classified as rugged against dose dumping.

Keywords: Paliperidone, osmotic, polyox, regulatory, biowaiver, discriminating, nitrosamine, alcohol dose dumping

Treatment and Management of Schizophrenia: A Review of Current Standards, Novel Approaches and Future Directions

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Abstract:

Schizophrenia is a severe psychiatric disorder characterized by emotional, behavioral and cognitive disturbances and the treatment of schizophrenia is often complicated by noncompliance and pharmacoresistance. Schizophrenia is the most frequent and debilitating of all psychotic disorders and carries a high-cost burden for the society. The search for the pathophysiological mechanisms underlying schizophrenia has resulted in the proposal of several hypotheses to explain the impacts of environmental, genetic, neurodevelopmental, immune and inflammatory factors on disease onset and progression. This review discusses the newest insights into the pathophysiology of and risk factors for schizophrenia and notes novel approaches and future directions in schizophrenia treatment and potential diagnostic. Recent research in schizophrenia has begun to yield a complex picture, with many mechanisms, including glutamatergic, GABA and other neurobiological systems, being possibly involved. Current antipsychotics, acting primarily by D2 receptor antagonism, are fairly effective for positive symptoms; however, they are relatively ineffective for negative or cognitive symptoms of schizophrenia. There is an active search for drugs to reduce resistant or residual positive psychotic symptoms; potential approaches include enhancing either N-methyl-d-aspartate (NMDA) or metabotropic glutamatergic signaling as well as modulating other non-D2 receptor systems. Pharmacological enhancement of psychosocial treatments, such as cognitive behavioral therapy and cognitive remediation, is another therapeutic approach being studied. A paradigm shift is occurring toward early intervention and prevention of schizophrenia in the prodrome of the illness. Discovery of pathophysiological mechanisms is helping deconstruct schizophrenia into therapeutically more meaningful dimensions and offer novel targets for drug discovery. Pharmacogenomic approaches are being developed to specifically predict individual treatment response and thereby enable personalized treatment selection.

Keyword: Schizophrenia, psychotic disorders, pharmacogenomic, pharmacological, antipsychotics, pharmacoresistance, novel targets, drug discovery

A Review on Medicinal Use of Rudraksh

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Abstract:

Elaeocarpus ganitrus Roxb. (Rudraksh), a member of the Elaeocarpaceae family, is described here along with facts regarding its botanical, phytochemical, ethnomedical, and pharmacological properties. It is well-known for both its therapeutic qualities and intriguing fruit stones. In Hinduism and Ayurveda, the local medical system, it achieves a noteworthy status. Giant evergreen trees with wide leaves, like rudraksha, provide the traditional material for Hindu praying bead. Multiple components of the Rudraksha, including the beads, bark, leaves, and outermost layer of the beads, are used in conventional therapies to treat a variety of ailments, including mental illnesses, headaches, fever, skin diseases, and wound recovery. Thermogenic, sedative, cough-relieving, anorexigenic, cephalagic, migraine-causing, anorexigenic, beneficial for treating bronchitis, neuralgia, cephalagia, anorexia, migraine, manic illnesses, and other brain problems are all listed as benefits of Rudraksha fruits in Ayurvedic scriptures. It also acts as an inhibitor against asthma, high blood pressure, arthritis, palpitations, painful nerves, anxiety, depressive stress, palpitations, loss of focus, and liver illnesses. It is known to have a wide range of pharmacological properties, including high antibacterial, analgesics hypoglycemic, antiulcerogenic, and anti-inflammatory properties. It has been discovered that phytosterols, lipids, alkaloids, flavonoids, carbohydrates, proteins, and tannins play a significant role in the medicinal potential of *E. ganitrus*. Also present in leaf aqueous extract are glycosides. Gallic, ellagic, and quercetin are present in leaf ethanol extract.

Keywords: Phytochemicals, pharmacological, antioxidant, therapeutic

A Review on Needle Free Injection in Current Scenario

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Abstract:

In current scenario many researchers are working to develop technology. In order to create the therapeutic effects and administer the medicine in a more effective and painless manner. Innovative approaches to provide different medications to patients without puncturing their skin with a traditional needle include needle-free injection systems. For a variety of medications, needle-free injections are quite successful. Since conventional needle problems are avoided by needle-free systems, they are safer, more affordable, and better suited. Injections can be completed far more quickly than with regular needles, and there are no waste problems. This review aims to shed light on the fundamental workings of this technology, the various types of technologies currently in use, and its applications.

Keywords: Needle free injection, drug delivery, needleless technologies

Evaluation of *Chenopodium Album* Extracts for Nootropic Activity Potential in Wistar Rats

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Abstract:

Various plants are being used in complementary and alternative medicines for Nootropic activity. Attention is being focused on the investigation of the efficacy of plant based drugs used in the traditional medicinal system because they are cheap, have little side effects and according to WHO, about 80% of the world population still rely mainly on herbal remedies. The present work was under taken to evaluate the Nootropic activity of *Chenopodium album* leaves extracts in Scopolamine induce Alzheimer type Dementia in rats. For the purpose ethanolic & aqueous extract of *Chenopodium album* leaves were prepared and screened for phytochemical constituents and Nootropic activity. For pharmacological activity Wistar rats weighing 150-200 g were randomly divided in to seven groups (n=6/group). Group I served as normal control & received vehicle; Group II served as Scopolamine control & received vehicle; Group III standard drug piracetam (150 mg/kg, i. p); Groups IV & V were administered with ethanolic extract of *Chenopodium album* leaves (250 & 500 mg/kg respectively, p.o) and Groups VI & VII received aqueous extract of *Chenopodium album* leaves (250 & 500 mg/kg respectively, p.o). All treatments were given orally & intraperitonial started after 14 days inject Scopolamine (except normal control group) and continued for 14 days along with Scopolamine. The phytochemical screening of ethanolic & aqueous extracts showed the presence of alkaloids, saponins, quinones, coumerins, sugar and gums. Ethanolic and aqueous extract of Tectona grandis leaves at 250 and 500 mg/kg showed decrease in MDA, LDH, Nitrite and restored SDH and GSH level. From the present study it can be concluded that aqueous and ethanolic extracts of *Chenopodium album* leaves extracts possess significant Nootropic activity against Scopolamine induce Alzheimer type dementia in rats. It appeared from the study that, the activity of ethanolic and aqueous extract of *Chenopodium album* leaves could be due to presence of flavonoids, tannins, diosgenin, quinones and saponins. However, detailed phyto-pharmacological study of leaves extracts will be useful to pin point the activity.

Keywords: *Chenopodium album*, ethanolic extracts, phytochemical constituents, *Tectona grandis*, alzheimer's

Biosynthesis and Characterization of *Citrus Limon – Vitis Vinifera* Leaf Silver Nanoparticles and Investigating their Antibacterial Efficacy

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Abstract:

Plant-mediated synthesis of nanoparticles has been considered a green route and a reliable technique for the synthesis of nanoparticles due to its eco-friendly approach. In this study, we report a simple and eco-friendly approach for the synthesis of silver nanoparticles (AgNPs) using ethanolic of *Citrus limon* and *Vitis vinifera* leaf extract as reducing agents. In our study, phytoconstituents in the *Citrus limon* and *Vitis vinifera* leaf silver nanoparticles were characterized, screened qualitatively and their antioxidant efficacy, antimicrobial potential was determined. The ethanolic extract of *Citrus limon* and *Vitis vinifera* leaf exposed to AgNO3 solution showed a change in color from green to brown due to the reduction of silver ions at room temperature within 48h of incubation confirming the synthesis of AgNPs. UV-visible spectra analysis revealed that the synthesized AgNPs had a sharp surface plasmon resonance at around 350 nm, while the X-ray Diffraction (XRD) patterns confirmed distinctive peaks indices to the crystalline planes of the face-centered cubic silver. Scanning Electron Microscopy (SEM) analysis results confirmed the presence of spherical-shaped AgNPs by a huge disparity in the particle size distribution with an average size of 40 nm. The FT-IR spectra of *Citrus limon* and *Vitis vinifera* leaf AgNPs show interaction of biomolecules having an intensive peak at 457 to 2927 Cm^{-1}.These FTIR bands denote stretching and vibrational bands responsible for the compounds like flavonoids, terpenoids, phenols and amino acids. The synthesized AgNPs showed strong antibacterial activity against all the tested bacterial strains. In the future, the *Citrus limon* and *Vitis vinifera* leaf AgNPs can be used as potent therapeutically agents and can be further exploited for their other beneficial effects in pharmacological studies.

Keyword: Silver nanoparticles, ethanol extract, *Citrus limon* , *Vitis vinifera* leaf, characterization, antibacterial

Synthesis, and Evaluation of Anticancer Potential of Some New Benzopyran Analogues Using MTT and *In Vitro* Scratch Assays

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Abstract:

Background: Breast cancer is the major of cause of deaths in female cancer patients. Benzopyrans and imines are known to offer high anticancer potential. Objective: Present study was intended to carry out the synthesis, characterization and anticancer activity of some new benzopyran analogues (NBA).

Material and Methods: Study involved synthesis of NBA (2), by hydrazination of benzotetronic acid ester (1), followed by Schiff reaction with different aldehydes to offer NBA (4a-d). Synthesized NBA were characterized based on the 1H-NMR, 13C-NMR, FTIR, and mass spectrometric data. Synthesized compounds were investigated for their anticancer potential against MCF-7 cancer cell lines using MTT assay, cytotoxicity study (cell viability) against HEK-293 cells, and *in vitro* scratch assay.

Results and Discussion: The study revealed that structures of NBAs were in full agreement with their spectral data. Appearance of new IR signal at 2926 and 1698 cm-1 confirmed the CH 3 group and C=O group stretching thereby confirmed the presence of ester group in the structure of NBA (1). Absence of IR signal at 2926 cm -1 related to CH 3 group and appearance of new IR doublet signal at 3267 cm -1 for N-H group stretch, confirmed the presence of hydrazide group in NBA (2). Absence of IR doublet signal at 3267 and Appearance of new IR signals between 1594-1582 confirmed the presence of C=N group in the NBA (3a-3d). Appearance of new 1H-NMR signal between 9.33-9.35 confirmed the presence of N=CH protons in the NBA (4a-4d). Appearance of new 13 C-NMR signal at 151.37-152.09 confirmed the presence of N=C group in the NBA (4a-4d). The parent ion peaks of all NBAs were in full agreement with respective molecular weight in their respective mass spectra. The cell viability study, MTT and *in vitro* scratch assay of NBAs, revealed compound 4d to possess highest activity and safety when compared with standard (irinotecan).

Conclusion: Present study concludes that among all synthesized compounds, the compound 4d possess highest anticancer potential and more safety when compared with irinotecan. It was observed that incorporation of electron donating group (p-methoxy) in the NIA offered maximum safety and anticancer activity. However, further clinical studies are required to further establish its clinical significance.

Keyword: Benzopyran, anticancer, cytotoxicity, synthesis, imines

Study on Action, Detection and Management of Reactive Carbonyl Species in Various Chronic Diseases

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Abstract:

Reactive carbonyl species (RCS) are highly reactive molecules that are generated from the continuous oxidation of carbohydrates, lipids, and amino acids within the human body. Some RCS commonly found in humans include hexanal, acrolein, 4-hydroxy-2-nonenal, methylglyoxal, malondialdehyde, isolevuglandins, and 4-oxo-2-nonenal. These molecules damage essential cellular components such as proteins, nucleic acids, and lipids, leading to cytotoxicity, mutagenicity, and the formation of adducts and crosslinks that contribute to aging and various chronic diseases, including inflammatory disease, atherosclerosis, cerebral ischemia, diabetes, cancer, neurodegenerative diseases, and cardiovascular disease. Despite their damaging effects, the constant presence of RCS in living cells suggests their importance in signal transduction and gene expression. A thorough understanding of RCS properties, metabolism, and relation to metabolic diseases can aid in the development of effective prevention strategies for numerous chronic diseases. Treatment approaches for RCS-associated diseases include endogenous RCS metabolizers, carbonyl metabolizing enzyme inducers, and RCS scavengers. However, the limited bioavailability and bioefficacy of RCS sequesters emphasize the importance of nanoparticles and nanocarriers in treatment. Several bioassays and analytical techniques are used to identify RCS and screen compounds for their ability to sequester RCS. This study provides an in-depth study of RCS sources, types, properties, identification techniques, therapeutic approaches, nanocarriers, and their role in various diseases. Present study will assist in the development of therapeutic strategies to combat RCS-associated chronic diseases.

Keyword: Reactive carbonyl species, scavengers, identification, validation, chronic diseases

Phytochemical and Pharmacognostic Study of *Ficus religiosa*

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Abstract:

Ficus religiosa (L.), commonly known as peepal (Moraceae), is used traditionally as antiulcer, antibacterial, antidiabetic, antiasthamatic , in the treatment of gonorrhea and skin diseases. Bark is white or brown in color. The leaves are shiny, thin, and bear 5–7 veins. Fruits are small, about ½ inch in diameter. It is circular in shape and compressed. When it is raw, it is of green color and turns black when ripe. Morphological characters identified by studying Powder characteristics. Result of study shows presence of upper and lower epidermal cells in surface view, anomocytic stomata, palisade and spongy cells, parenchyma and collenchyma cells, reticulate, pitted and spiral vessels, thick-walled fibre, crystal fibre, prismatic crystals of calcium oxalate. Physicochemical evaluation including parameters such as water and alcohol soluble extractive value, moisture content, total ash value, acid insoluble ash value and water soluble ash value was carried out. Test for carbohydrates, proteins, amino acid ,steroids, terpenes, alkaloids tannins and phenolic compounds was performed in leaf, bark and fruit. The study shows presence of most of phytochemicals in leaf, bark, and fruits like carbohydrates, proteins, amino acid ,steroids, terpenes, alkaloids tannins. Fats and oil were found absent.

Keywords: *Ficus religiosa*, antiasthamatic, phytochemical

Female University Student's Knowledge on Breast Cancer and Breast Self-Examination Practice

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Abstract:

Background: As among all cancers, breast cancer is most prevalent and considered as the major cause for female cancer patients, so, self-examination is an important aspect for the investigators. Objective: Present study was intended to assess the knowledge on breast cancer (BC) and breast self-examination (BSE) practices among female university students in a private university, Malaysia.

Methodology: This investigation was carried out using a simple random sampling procedure. Raosoft sample size calculator suggested a sample size of 278 with a confidence interval of 95% and a margin of error of 5%, and a population size of 1000. Self-administered questionnaire was developed and it was validated (face and content), and its internal consistency was found to be 0.75 (acceptable). Three sections make up the questionnaire, which has 21 questions overall (excluding demographics). Prior to the study, each participant signed an informed consent form. After the participants filled questionnaires, the study team collected their feedback. The collected data were entered into Microsoft Excel Sheets, where it underwent SPSS Statistics (version 25) analysis. Categorical data were provided as counts and valid percentages, and the association between two separate categorical variables was determined using the chi-square test. Blooms cut off scoring system was used for assessing the knowledge as high (80-100%), moderate (60-79%) and low (60%). Results: A total of N=309 responses were collected. The mean age of the respondents was 20.58 years (SD =1.479, range = 19 - 30). One tenth of the respondents had family history of breast cancer [32 (10.4%)].98.4% have heard of breast cancer. The study revealed media as the major source of information on breast cancer. 89.3% have heard of BSE. 72.5% of respondents did not practice BSE. 94.2% respondents think that BSE is a useful tool to detect breast cancer. 85.8% of the respondents knew that BSE is performed by the individual. More than half of the students [193 (62.5%)] have not been taught on how to do BSE. Only [116(37.5%)] of the respondents correctly stated that BSE should be performed monthly. For analyzing the data, chi-square test was used to see any significant association between demographics and knowledge related questions. It was found that there is significant relationship between ethnicity and knowledge questions which shows that Chinese were having good knowledge when compared to other race.

Conclusion: According to the study, the majority of respondents had in-depth knowledge of both breast cancer and BSE, but due to a lack of understanding about how to practice, most did not regularly engage in BSE. To raise awareness of breast self-examination techniques for the early identification of breast cancer, educational campaigns must be launched.

Keyword: Breast cancer, breast self-examination, female students, Malaysia

Malaysian Community Pharmacists' Knowledge, Attitude and Perception About the Potentially Inappropriate Medications

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Abstract:

Background: Potentially inappropriate medications (PIMs) among geriatric are detrimental to both clinical outcomes and health care costs. Knowledge of PIMs among community pharmacists plays vital role in minimizing the inappropriate prescribing. Beers Criteria is commonly used guidelines that lists specific PIMs, where community pharmacists would benefit from knowledge of Beers Criteria in detecting PIMs in primary care. Aim: This study therefore is intended to investigate the knowledge, attitude and perception of PIMs among community pharmacists in Kedah, Malaysia. Methodology: This is a prospective, cross-sectional study. The knowledge of PIMs; perception regarding PIMs; awareness of Beers Criteria; and perception of educational needs to enhance community pharmacists' knowledge about PIMs was assessed by using 5-point Likert scale. Descriptive statistics and Chi-square tests were used to analyse the data. Results and Discussion: In this study a total of 107 community pharmacists participated. The respondents demonstrated a higher-level knowledge of PIMs. All of the respondents agreed inappropriate medications among geriatric will cause increased in healthcare utilization, health complications and hospitalization. The respondents demonstrated poor awareness of Beers Criteria. Majority respondents were uncertain that Omeprazole is the most common Beers medication prescribed in healthcare system. Majority of respondents agreed incorporation of geriatric pharmacotherapy education as a core subject or elective subject and postgraduate education in geriatric pharmacotherapy can help to enhance community pharmacists' knowledge about PIMs among elderly patients. Conclusion: The community pharmacists in Kedah demonstrated high knowledge level of PIMs but poor awareness of the Beers Criteria. Thus, there is a need to increase the awareness and use of Beers Criteria among community pharmacists.

Keywords: Geriatric pharmacy, community, inappropriate medications, AGS-Beers criteria

In vitro comparative dissolution study of different brands of Teneligliptin & Metformin HCL Prolonged Release Tablets

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Abstract:

Evaluation of the quality control standards of different generic brands of Teneligliptin & Metformin HCL extended-release tablets, has been compare with the innovator Glucophage XR®. The objective of this study is to determine the dissolution data by using f1 & f2. In this dissolution test following general method using 6.8 pH phosphate buffer volume 1000 ml at 100 rpm, USP I apparatus. Also, by using UV spectrum at 232nm. The uniformity of weight for the Six brands of this tablet with values that compiled with I.P specification and deviated less than 5% from the mean value. Using hardness tester, the strength of the tablets determined. Hardness of the tablets was in the range of 5.60±0.13-7.98±0.18kg/cm2 with all brands. The result of tablet friability test of all brands tested with friability values of 0.110% to 0.821% w/w. According to I.P. no batch having friability values of 0.110%w/w. This study concludes the physicochemical characteristic of six brands of this tablet complied with the official IP specification for hardness, friability, weight variation and dissolution. f1 and f2 factor provide a uniformity in five brands of this tablet and analysis suggest that the Ingola M brand fails the test.

Keywords: Dissolution, teneligliptin, metformin HCL, glucophage XR, UV spectroscopy

GC-MS Analysis of Bioactive Compounds from the Whole Plant Methanolic Extract of *Cynodon dactylon* (L.) Pers.

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Abstract:

Plants have been an important source of medicine with qualities for thousands of years. *Cynodon dactylon* (L.) Pers commonly known as Bermuda grass belongs to the family poaceae. In ethnomedicinal practices, the plant *Cynodon dactylon* used in the treatment of various diseases and has pharmacological actions. The present study was carried to identify the phyto- components present in the methanolic extract of *Cynodon dactylon* (L.) Pers by GC-MS analysis to ascertain its usage by the local community as a plant possessing medicinal properties. Total 68 compounds were identified. The major constituents were furfural (2.33%), 3-aminopyrazine 1-oxide, levoglucosenone (1.39%), tetrapentacontane (2.47%), 9-octadecanoic acid (2.27%), n-hexadecanoic acid (7.5%), Neophytadiene(1.30%) and benzene propanoic acid (1.91%). These findings support the traditional use of *Cynodon dactylon* in various disorders.

Keywords: *Cynodon dactylon*, GC-MS analysis, bioactive compound, methanolic extract

Antibiotic Use and Resistance: A Cross-Sectional Study Exploring Knowledge, Attitudes and Practices Among Under Graduate Students Delhi, India

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Abstract:

Antibiotic resistance is a growing concern in India, where the widespread use of antibiotics and the emergence of antibiotic-resistant bacteria pose significant public health challenges. This cross-sectional study aimed to explore the knowledge, attitudes, and practices related to antibiotic use and resistance among undergraduate students in Delhi, India. The study used a questionnaire to collect data from a sample of undergraduate students, and the results revealed several important findings. The study found that many students had misconceptions about antibiotic use and resistance, with a significant proportion believing that antibiotics were effective against viral infections. Additionally, many students reported engaging in self-medication and non-adherence to antibiotic regimens, which are known risk factors for antibiotic resistance. The study also found that factors such as education level, income, and previous antibiotic use were associated with antibiotic resistance. These findings have important implications for public health interventions aimed at promoting appropriate antibiotic use and reducing the burden of antibiotic resistance in India.

Keywords: Antibiotic, resistance, bacteria

Evaluation of Toxicological and Molecular Mechanism of Pyrethoids with Focus on Male Reproductive Signaling Pathways: An *In silico* Study

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Abstract:

Pyrethroids are synthetic pesticides most commonly used in agricultural purpose to control the pests. Several studies shown the reprotoxic effects of pyrethroids, mainly by supressing the testosterone production (steroidogenesis). Testosterone is an important reproductive hormone for male reproductive health, thus any disturbances in the synthesis of testosterone could affect the performance of reproductive functions. Several studies reported the pyrethroids mediated steroidogenesis impairment, yet the exact underlying mechanism is not well defined. In the present study we investigated the interactive potential of different pyrithroidal agents (No: 40) with human androgen (AR), and steroidogenic acute regulatory protein (StAR) by employing various *In silico* techniques. In the current study we found that all the 40 pyrethroids were capable to interact with StAR protein and androgen receptor, among the pyrethroids tested, etofenprox and cyhaltothrin showed highest binding affinities with androgen and StAR protein. The interaction of pyrethroids with these key receptors might interfere with testosterone production. And network analysis indicated that most of the pyrethroids interacted with CCKR and GnRH signalling pathways, it might results in other disease. Further, validation of in silico results obtained from this study might be useful to prioritize chemicals for subsequent screening using *in vitro* and *in vivo* analysis.

Keywords: Pyrethroids, male reproductive health, impaired testosterone production, StAR protein

Artificial Intelligence based medical devices: Current scenario and future perspectives

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Abstract:

Artificial intelligence (AI)-based medical devices are revolutionizing healthcare across the globe. From increasing diagnosis accuracy, to improving hospital workflow, to early disease detection, AI and machine learning (ML) are transforming healthcare practice by interpreting vast amounts of data on a daily basis. Despite these improvements to healthcare delivery, the regulation of AI-based medical devices is still in its developmental stages. The approaches to establish the capabilities of software developers to respond to real-world AI solutions are required to adapt in real time. As technology and science advance, we can expect to see earlier disease detection, more accurate diagnosis, more targeted therapies and significant improvements in personalized medicine.

New AI advances in hardware and software have allowed interpretation of physiological data from sensors which enabled rapid growth of medical devices. The application of artificial intelligence in this field will improve the consistency of diagnosis and increase the success rate of treatment. The future of AI application can be seen not only in increasing accuracy of treatment, but also in preventing injuries and deaths caused by medical devices. As healthcare is generating a lot of data, big data structures can be used to predict safety and performance of medical devices. Even with recognized obstacles one can conclude that AI has already completely changed the traditional medical model, significantly improved the level of medical services, and ensured health in all aspects. It is yet to be seen how future development prospects of medical AI will impact the human population in tackling the rising challenges.

Keyword: Artificial intelligence, healthcare, machine learning, medical service, medical device

Research and Development; Opportunities, Challenges and Solutions

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Abstract:

Research and development in the pharma industry involves pre-clinical research and discovery of innovative drugs. clinically testing of prescription drugs in trials, preparation and submission of application of food and drug administration or FDA approvals, designing production process for the new products. Pharmaceutical industry has many challenges which constantly threaten the existence of many of its companies. As difficult market condition high healthcare cost and poor Research & Development and the output continue to take center stage in the business affairs of industry. Some problems associated with Indian Pharma sectors are lack of capabilities in the area of innovation, quality compliance enquiry to overcome these problems industry need some Artificial intelligence tools, industries academia linkage, coherent policies and investment in other modern areas. Pharmaceutical companies must actively seek ways to address these challenges. strategies that help in identifying the root cause of these challenges must be implemented with a sense of urgency. Any delay in doing so will leave millions of people untreated for devasting diseases which constantly place heavy burdens on the wellbeing of societies.

Keywords: Research and development, challenges, opportunities

Artificial Intelligence in Cancer Diagnosis and Treatment

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Abstract:

Cancer is an abnormal growth of cell which has ability to involve adjacent tissues and even distant organs and eventually death of the affected patient if the tumor has progressed to the stage where it can't be treated. It is a second leading cause of death. The treatment process of cancer is very time taking. accurate early stage of diagnosis can increase the mortality rate of a infected persons. Humans are limed by their own level of knowledge. where the use of AI can be the best option to address the difficult health care challenges including complex biological abnormalities. AI and machine learning will strengthen to identify the earlier stage of cancer, to improve drug design for tumor, help to established the controlled treatment of cancer to overcome the overtreatment, by identifying right stage of cancer to give details about the amount of drug should be given in combination. Overall, AI is a very helpful tool in chemotherapy, radiotherapy and in immunotherapy AI will be a powerful tool for human cancer research and treatment in the future. AI could speed up the discovery of new materials, it could accelerate the development and treatment of cancer.

Keywords: Cancer, AI, machine learning, chemotherapy

Artificial Intelligence in Virtual Clinical Trial

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Abstract:

Artificial intelligence is an ability of machine to perform the cognitive functions we usually associated with human body. The AI technology is utilized in each step of the drug designing procedure, which decreases the health related hazardous to preclinical trials and also reduces the cost substantially. A virtual clinical trial, also known as decentralized or remote clinical trial, is a type of clinical trial that leverages technology to collect data and conduct research remotely, without requiring participants to physically visit a traditional clinical research site. In a virtual clinical trial, various aspects of the trial, such as participant recruitment, informed consent, data collection, monitoring, and follow-up, are conducted using digital tools and platforms. AI work through utilization of AI technologies and algorithms in the design, implementation, and analysis of clinical trial conducted in virtual or remote settings. Virtual clinical trials aim to enhance patient engagement, and analysis. During trial conduct, Al-based sensors and other wearable devices improve patient monitoring. Finally, AI tools facilitate more comprehensive statistical analysis and tackle the challenging issues of missing data and missing visits.

Keywords: AI, clinical trial, monitoring, data collection, analysis, virtual clinical trial

Chitosan Nanoparticles used in Treatment of Diabetes Mellitus

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Abstract:

Diabetes mellitus is a disease in which the body cannot control the amount of glucose produced and due to ineffective production of insulin or lack of insulin production in pancreas leads to this chronic endocrine and metabolic disorder. Chitosan is a carbohydrate biopolymer which has excellent biocompatibility and biodegradability properties and its derivatives acts as an anti-diabetic supplement without having any side effects. Therefore, they can be adapted as a nanocarriers to improve the drug delivery system used in the treatment of diabetes mellitus. Various drug delivery systems used nowadays are oral, subcutaneous and nasal passages. These drug delivery systems are different from the old traditional methods of injectables used for treatment. A few nano drug molecules have been produced that are used in anti-diabetic drugs as they mimic the endogenous insulin delivery and reduces the risk of hypoglycemia. Many *in-vitro* and *in-vivo* studies have been conducted with chitosan and its derivatives that proves anti-diabetic properties are mediated through glucose uptake, lipid metabolism and insulin resistance. The new methodologies used for the preparations are immensely beneficial and exhibits magnificent chemical and pharmacokinetic properties.

Keywords: Diabetes mellitus, Chitosan Nanoparticles, Drug delivery System, *in-vitro* and *in-vivo* studies

Future of the Pharmaceutical in Healthcare Start with Regulatory Affairs: Challenges and Perspectives

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Abstract:

The goal of the regulatory affairs in pharmaceutical is the protection of human health, ensuring safety, efficacy, and quality of drugs, making sure appropriateness and accuracy of product facts. Regulatory affairs are constantly changing, presenting many opportunities for industry growth and standardisation. It is needed for harmonization in standards has caused constant technique in regulatory submissions. Regulatory affairs are to provide the basis for the assurance of high quality of food products which can increase consumers interest form ensuring the efficacy, quality, and safety for better healthcare system. After so many incidents, the regulatory bodies introduced the new laws and guidelines which improve the quality, safety and efficacy of the products. Every country has its own regulatory authority, which is necessary and responsible to enforce the rules and regulations and issue guidelines. Regulatory affairs give tactical and practical advice to R&D, Production, QC Department. Regulatory affairs important for preparation of well-ordered and Ensure fidelity and complaisance with all the applicable CGMP, ICH, GCP, GLP guidelines regulations and laws. Challenges that face regulatory affairs to deal with conflicting loyalties, motivations, social and ethical, responsibilities. We are at the start of some significant changes in pharmaceutical industry given as: - Maximized clinical trial capacity, avoiding use of the same patients, and utilizing trial networks. Harmonized regulatory processes and mutual reliance to avoid duplication. Clinical evaluations via joint reviews or shared working models. Use of artificial intelligence, combined with human support and input, to advance regulatory review and post-marketing surveillance processes, and improve adaptive clinical trial designs.

Keywords: Pharmaceuticals, healthcare, regulatory affairs, clinical trial, research and development

Future of 3D Printing in Pharmaceuticals

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Abstract:

Three-dimensional printing (3D printing) is a manufacturing process including building up an object layer by layer. This method is also referred to as additive manufacturing (AM). The application of additive manufacturing has advanced the pharmaceutical sector's transition to the era of personalized medicines. It can potentially revolutionize pharmaceutical practice or production, mainly regarded as individualized medicines. Medication products with customized doses, combined medications, geometries, and release properties can now be produced on demand by 3D printing. It will assist in the creation of innovative forms such as polypills, gastro-floating tablets, and orodispersible tablets. Over the last five years,considerable efforts have been achieved to advance and transform this technology from a hypothetical benefit into a possibility in pharmaceutical production. Unique to additive manufacturing, the immediate creation of customizable models can be applied to fields like modified implants and bio-engineering models. Early-stage medication development can be incredibly beneficial from the use of 3D printing. In this review, we have also studied several technologies used in the 3D printing of pharmaceuticals.

Keywords: 3D printing, 3D printing formulations, 3D printing in pharmaceutical dosage forms

Current and Future Perspectives of Pharmaceuticals in Health Care

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Abstract:

Introduction: The use of pharmaceuticals has revolutionized the field of healthcare, improving the quality of life for millions of people worldwide. Pharmaceuticals can help to manage chronic conditions, reduce pain and inflammation, fight infections and even cure certain diseases. As medical knowledge and technology continue to advance, the use of pharmaceuticals is expected to play an increasingly important role in healthcare.

Current Perspectives: Pharmaceuticals are currently used to treat a wide range of conditions, including cancer, diabetes, cardiovascular disease, and mental illness. Advances in drug delivery systems and personalized medicine have made it possible to tailor treatments for individual patients & need, resulting in better outcomes and fewer side effects. The use of biologics, such as monoclonal antibodies, has also revolutionized the treatment of certain diseases, including cancer and autoimmune disorders.

Future Perspectives: The future of pharmaceuticals in healthcare is promising, with many new drugs and technologies in development. The area of focus is the development of gene therapies, which could potentially cure genetic diseases by replacing or repairing faulty genes. Nanotechnology is also being used to develop targeted drug delivery systems that can deliver drugs directly to affected cells or tissues, reducing side effects and increasing effectiveness. Artificial intelligence is being used to identify new drug targets and predict drug interactions, potentially accelerating drug development and improving patient outcomes.

Conclusion: Pharmaceuticals have revolutionized healthcare and will continue to play an important role in the future of medicine. Advances in drug delivery systems, personalized medicine, biologics, gene therapies, nanotechnology, and artificial intelligence are expected to further improve the safety and effectiveness of drugs, leading to better patient outcomes and a healthier population overall.

Keywords: Pharmaceuticals, drug delivery systems, personalized medicine, biologics, gene therapies, nanotechnology

Role of Artificial Intelligence in Healthcare

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Abstract: The healthcare scenario in India offers a variety of striking contrasts. In all, two billion people lack access to necessary pharmaceuticals, while 400 million people lack any kind of basic healthcare. As a result, there are unmet health requirements for more than one-fourth of the global population. The issue of how to sustain a sizeable portion of the world's population who still lack access to basic healthcare services now faces the international community. Healthcare has experienced a disruptive breakthrough from AI. AI has aided doctors and other medical professionals in a number of areas, including medical imaging, geocoding health data, epidemic and syndromic monitoring, predictive modeling and decision assistance, and health information systems, thanks to its complex algorithms. AI is quickly taking over the healthcare system. In order to manage patients and medical resources, it converts the manual health system into one that operates automatically. Drug development is a renownedly expensive process. Many of the analytical methods used in drug development can be more effectively applied with machine learning.

Keywords: Artificial intelligence, drug, machine learning, healthcare, disease

UPLC -MS/MS Bioanalytical Method Development and Validation for the Estimation of Lesinurad in Rat Plasma

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Abstract:

Lesinurad is a novel, selective uric acid transporter (URAT1) inhibitor showing effects for treatment of gout in combination with xanthine oxidase inhibitor. The method development of lesinurad was performed by using rat plasma indicating bio-analytical method development. Bioanalysis, technique where qualification and quantification of biological samples were performed. Bioanalytical techniques interpret the pharmacokinetic data as determination of bioavailability and bioequivalence. Bioanalytical method development and validation of lesinurad drug was performed by Ultra-High Performance Chromatography involving acetonitrile and ammonium dihydrogen orthophosphate buffer as mobile phase using HT C18 column (30× 10mm, 1.8µm), Mass change ratio (m/z) of lesinurad was found to be 401.9/176.79. Validation of range of 0.0002µg/ml to 0.659µg/ml. the overall recovery by this bioanalytical method HQC to LQC is 51.3%-63.1. this helps in estimation of pharmacokinetic-pharmacodynamic parameter.

Keywords: Lesinurad, rat plasma, UPLC-MS/MS, validation

Lyme Disease: A Tick Borne Illness

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Abstract:

The spiral-shaped bacteria Borrelia burgdorferi produces bacterial lipoproteins that cause Lyme disease, a seriously complex multi-organ inflammatory and vector-borne disease. It is also known as borreliosis and Bannwarth syndrome. It had been first reported in the United States in the town of Old Lyme, Connecticut, in 1975. The black-legged ticks carry these bacteria. The life cycle of black-legged ticks is usually 2 years, and they have four life stages. The disease has three phases, which are phase 1 phase 2, and phase 3. The symptoms of the disease are fever, lightheadedness, muscle pain, heart problems, numbness, tingling, and abnormal muscle movement. Diagnosis is necessary for Lyme disease in two steps: The initial step is a high-sensitivity ELISA test with positive outcomes followed and confirmed by a more specific Western blot assay. The patients are treated with antibiotics. Analgesics are prescribed for joint stiffness. Antibiotic therapy is beneficial in most cases, but some patients develop chronic symptoms that do not respond to antibiotics. Therefore, the aim of this chapter is to summarize our current knowledge of the symptoms, clinical diagnosis, and treatment of Lyme borreliosis.

Keywords: Lyme disease, blacklegged tick, ELISA, western blot

Carbon Nanotubes Advance in the Science and Technology

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Abstract:

Carbon nanotubes are a family of nanomaterials, which can synthesize naturally, chemically, physically, mechanically and biologically. These are chemically stable and inert materials. With inimitable characteristics (structure) among the nanomaterials world, carbon nanotubes (CNTs) have progressively shown numerous applications in various sciences. CNT have stimulated intense experimental and theoretical interests of chemists, physicists, biologists, and material scientists. CNTs are an allotropic form of carbon with dimensions in the nanoscale and length in the micrometre scale that form a needle-like structure with a large surface area. The carbon atoms bind to each other, forming sheets of six-membered carbon atom rings (graphite) that wrap into cylindrical tubes. CNTs can be classified into single-wall carbon nanotubes (SWCNTs) and multiwall carbon nanotubes. MWCNTs consist of multiple layers of graphite superimposed and rolled in on themselves to form a tubular shape. Owing to their remarkable physicochemical properties such as ultra-high mechanical strength, low weight, high surface area, high capacity of surface functionalization, excellent conductivity, thermal and chemical stability, unique length to diameter ratio, and tendency to aggregate. CNTs have extensively been exploited in various industries and sciences including spacecraft sea vehicles, nanoelectronics, cosmetics, pharmacology, and biomedical sciences.

Keywords: Carbon nanotubes, Ultra-high mechanical strength, large surface area, allotropic, multiwalled carbon nanotubes, single walled carbon nanotubes

Aloe vera and Curcumin as Emerging Therapeutics for the Management of Oral Submucosal Fibrosis

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Abstract:

Oral submucous fibrosis (OSMF) is a chronic, painful condition that mostly affects the oropharynx and oral cavity. Epithelial atrophy, inflammation, and widespread submucosal fibrosis are characteristic histological features of OSMF. Gingivitis and periodontitis are common gum diseases that affect the majority of the world's population. While periodontitis permanently harms the supporting tissues of teeth, gingivitis is a fairly common, non-destructive inflammatory illness of the gums that causes redness and irritation of the gingiva (gums). Its species includes aloe vera, commonly known as aloe barbadensis. The plant & natural anthraquinones, including barbaloin, aloetic acid, iso barbaloin, chrysophanic acid, ethereal oil, barbaloin, and others, have antibacterial effects. Plaque and gingivitis can both be reduced by using an aloe vera mouthwash, studies has shown. Arachidonic acid produces less prostaglandin E2 as a result of aloe vera & suppression of the cyclooxygenase activity. In addition to having anti-inflammatory properties by inhibiting the production of prostaglandin E2 from arachidonic acid, lipoxygenase, and cyclooxygenase, aloe vera also appears to have antioxidant properties through its ability to scavenge free radicals and superoxide radicals. Besides inhibiting lipid peroxidation and peroxide-induced DNA damage, curcumin, also known as *Curcuma longa*, scavenges oxygen species like the hydroxyl radical, superoxide anion, and singlet oxygen. The effective anti-inflammatory and anti-carcinogenic effects of curcumin are mediated by altering a number of signaling molecules. Curcumin inhibits protein kinases, c-Jun/AP-1 activation, prostaglandin biosynthesis, and the activity and expression of the enzyme cyclooxygenase (COX)-2, which suppresses a number of crucial components in cellular signal transduction pathways relevant to growth, differentiation, and malignant transformation. The main goals of treatments are to lessen inflammation and increase mouth opening. Along with their ability to treat disease, conventional chemical remedies can also be toxic to cells. We discussed the medicinal plant Aloe vera, Curcumin, which can be used as an alternative for the treatment of gingivitis and periodontitis (early-stage gum disease) (chronic-stage gum disease). These herbal remedies are the emerging theurauptic management of OSMF and more research is needed to evaluate safety and efficacy and therapeutic profile in the context of OSMF management.

Keywords: OSMF, periodontitis inflammation, herbal management, treatment, aloe vera, curcumin

Phytochemical Screening and Anti-oxidant Potential of Extract of *Solanum Nigrum*

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Abstract:

Solanum nigrum also known as makoy plant or Black nightshade, is a commonly used herb with ethnomedicinal importance. It is a constituent of several Indian medicines useful in relief of number of health conditions like fever, stomach issues, dysentery, ulcers, asthma, jaundice and whooping cough. The present study includes evaluation of phytochemical constituents, and *in vitro* antioxidant activities of extracts of Solanum nigrum leaves with the aim to furnish more information on its therapeutic potential. Extraction of the dried leaves of *Solanum nigrum* in 70% ethanol followed by partitioning was done in n-haxane, Dichloromethane (DCM), ethyl acetate and methanol. Preliminary phytochemical screening of the extracts and all the fractions was carried our followed by antioxidant study of the fractions by DPPH scavenging assay, nitric oxide scavenging assay and by determination of reducing power. Phytochemical screening of all the extracts and fractions revealed that n-hexane and DCM fractions contained maximum secondary metabolites including alkaloids, glycosides, saponins, phenolic compounds and coumarin. Reducing power of n-hexane and DCM fractions was found to increase with increase in concentration and was comparable to ascorbic acid. DPPH scavenging capacity of both the fractions was found to be comparable to quercetin and IC 50 value was found to be 69.346±0.002, 59.547±0.001 and 48.744±0.002 respectively. Nitric oxide capacity of these two fractions was maximum and IC 50 value of ascorbic acid and the two fractions was found to be 57.34±0.003, 35.665±0.002 and 26.511±0.003 respectively. This study forms basis for future research activities on extracts and active compounds of *Solanum nigrum*.

Keywords: *Solanum nigrum*, phytoconstituents, antioxidant, DPPH, reducing power

Current and Future Prospective of Pharmaceutical Manufacturing

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Abstract:

This observational descriptive study was carried out with the objective of exploring the contribution of the local pharmaceutical industry to drug security. I extracted information about drug class, drug type, country and place of manufacturing, shelf-life, and price. Results showed that the majority of drugs in the market are manufactured in Europe (43.86%), followed by Saudi Arabia (22.55%), China and India (20.47%), Americas (10.24%), and other nations (2.61%). Most of the manufactured drugs were prescription drugs (90.62%). In this work, the local pharmaceutical industry with the highest percentage of contribution to local drug security was Pharmaceutical Solution Industries (PSI), representing 5% of the items available in the Saudi market. The second highest percentage was 4% by TABUK Pharmaceutical Manufacturing CO., followed by SPIMACO (3%), JAMJOOM pharmaceutical company (2%), Riyadh Pharma (2%), and Jazeera pharmaceutical industries (2%). In addition, results from this study provide information about the most essential pharmaceutical products that need to be nationally manufactured or increased in production in order to rise the contribution of local pharmaceutical industries.

Keywords: Pharmaceutical, industry, manufacturing, price, shelf life, production

Formulation of Herbal *In-Situ* Gel for Ophthalmic Delivery

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Abstract:

Background: In the field of medication, it is necessary to deliver accurate quantity of dose to the patient. There is a presence of several delivery system in the world. Conventional dosage forms are used in early centuries but nowadays novel delivery system was emerged into the field of pharmacy.

Objective: This study enlightens the idea of incorporation of herbs into the *in-situ* gel formulation which enhances the bioavailability of herbal drug into the biological system. It also improves the release pattern of drug from delivery system. A novel delivery system that uses *in situ* gel improves drug administration to the site of action. Unique sol to gel transformation enhances the biological availability of drug and remains on the surface on applicable area.

Method: The data for the respective study has been collected by referring various published studies using PubMed and Google scholar as search engine. Data published by publishers like Bentham Science, Elsevier, Springer, Taylor and Francis, Nature, Plos One, etc were referred for content.

Result: *In situ* gel shows prominent delivery of herbal medicine through the system. By the several mechanisms which provide ease in the release of drug through system like temperature, pH triggered and ion activated system.

Conclusion: In today's world novel delivery system like nano formulation, transdermal patches, liposomes, *in situ* gels are introduced which improves the bioavailability of drug into the biological system. In case of ophthalmic delivery *in situ* gel used as novel approach which ensure the delivery, improves bioavailability, remains on the pre-corneal surface with fabrication of herbal drug.

Keywords: *In situ* gel, ophthalmic delivery, herbal, formulation

Assessment and Estimation of Herbal Hair Oil for Dandruff and Greying Hair

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Abstract:

Hair is an important part of human body and is derived from the ectoderm of skin. The hair follicle's ability to regenerate itself makes it unique. However, hair problems such as dandruff, head lice, seborrheic dermatitis, scalp folliculitis, dry hair, and premature hair greying can cause distress. Dandruff is a common hair problem that affects nearly half of pre-pubescent people and can be caused by both microbial and non-microbial factors. Excessive sun exposure, too much shampoo, too much combing, application of certain cosmetic products, and environmental airborne pollutants are non-microbial factors. Premature hair greying is a natural part of the aging process, but it can be a source of low self-esteem, especially for young people. Melanogenesis is responsible for the different colors of human hair, and the gradual loss of melanocytic function is linked to aging and the onset of gray hair. The prepared formulation helps in the effective prevention of the dandruff and restoration as well as prevention of premature hair growth. A herbal dandruff oil was formulated from a variety of herbal plant ingredients. The prepared herbal oil was evaluated based on its physicochemical parameters, including color, odor, pH, viscosity, acid value, saponification value, specific gravity, and refractive index. The results revealed that the prepared herbal oil had a dark brown color, with anti-fungal, anti-bacterial, antioxidant, and conditioning properties that are beneficial for healthy hair growth. Overall, it is important to take care of your hair and seek professional help if you experience hair problems.

Keywords: Dandruff, anti-fungal, anti-bacterial, antioxidant, melanogenesis

Effects of Natural Remedies on Memory Loss and Alzheimer's Disease

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Abstract:

Alzheimer's Disease (AD) is a neurological disorder related to aging, considered a memory issue. Numerous research has been conducted to identify viable AD therapies. There isn't yet a suitable therapeutic option, though. Symptomatic behavior may help with memory loss and other dementia-related problems even though there is no known cure for AD. Since ancient times, traditional medicine has been utilized as a memory booster all across the world. Dementia, amnesia, and AD have all traditionally been treated with natural medicine, which includes herbs and botanical remedies. The use of botanical remedies in many medical systems, especially the Unani school of medicine, has long been beneficial for managing and treating memory deficits. The majority of plants and herbs have been evaluated chemically, and clinical trials have also shown their effectiveness. The underlying mechanisms for the activities, however, are still being created. In this essay, we covered several medicinal plants that are essential to the traditional herbal therapy used to treat memory loss and AD.

Keywords: Alzheimer's illness, medicinal plants, effectiveness, neuronal regeneration, memory

Fabrication of PLGA Nanoparticles Using Combination of PCL-PVA-PEG Copolymer as Surfactant: *In-Vitro* Characterization and Cytotoxicity Study

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Abstract:

The objective of this study was to fabricate Poly lactic acid co-glycolic acid (PLGA) nanoparticles loaded with resveratrol using Soluplus® as a novel graft copolymer surfactant. PLGA nanoparticles were prepared using Soluplus® as a surfactant through double emulsification and single emulsification-solvent evaporation method. The particle size, polydispersity index, zeta potential, drug loading, and entrapment efficiency were evaluated. The morphology of the nanoparticles was examined using scanning electron microscopy. *In-vitro* drug release was assessed, and mathematical pharmacokinetic modeling was performed. Cytotoxicity of the nanoparticles was evaluated using MTT assay, and uptake/internalization was studied using confocal fluorescence microscopy. Results demonstrated the successful fabrication of PLGA nanoparticles using Soluplus®. The nanoparticles showed compliant particle size, polydispersity index, zeta potential, drug loading, entrapment efficiency, and drug release. The nanoparticles exhibited spherical and smooth morphology. Cytotoxicity study revealed a significant reduction in cell viability with the nanoparticles compared to free resveratrol, indicating improved efficacy. The study suggests that the formulated nanoparticles are a promising resveratrol delivery vehicle with potential anticancer properties.

Keywords: Resveratrol, PLGA, nanoparticles, soluplus, anticancer

Ziziphus mauritiana (Ber) – Traditional to Modern Approach of Treatment

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Abstract:

Ziziphus mauritiana have historically been widely used as medicine to treat a wide range of illnesses and physical conditions, including scabies, acne, mouth and gum irritation, respiratory issues, and chest and lung issues. Additionally, it has been claimed that the leaves of the Ziziphus genus are effective at bleaching the face and neck as well as treating hair growth. it is possible to isolate a variety of new beneficial therapeutic components and their phytochemical elements (such as antioxidant, hypolipidemic, and hypoglycemic components). There are currently several medications that are made (directly or indirectly) from plants, Due to growing understanding and changing attitudes in the field of health, modern day doctors and pharmacologists have also been steadily adopting the usage of medicinal plants against ailments. *Ziziphus mauritiana* properties has shown its potential as a source of various medicinal benefits. The plant has been found to possess anti-cancer, anti-oxidant, analgesic, anti-diarrhea, and anti-diabetic properties, which make it a valuable candidate for the development of new drugs and therapies. Additionally, the synthesis of nanoparticles from the plant extract has proven to be a promising solution for water treatment. These nanoparticles have demonstrated excellent water purification abilities, indicating the plant's potential in the development of sustainable and eco-friendly methods for water treatment. Overall, the findings from this review suggest that *Ziziphus mauritiana* has enormous potential in the field of medicine and water treatment.

Keywords: *Ziziphus mauritiana*, antioxidant, nanoparticles, anti-cancer

Characterization and Validation of Generic Linezolid Tablets Over Branded in Domestic Market

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Abstract:

The objectives of the research study were to Characterization and validation of Generic Linezolid Tablets over Branded in Domestic Market and evaluate their comparison results. Six Generic and four Branded Linezolid tablets were parched from market and evaluated for Size and shape, Appearance, Hardness, Friability Disintegration Time, Dissolution study and drug content. Six Generic Linezolid tablet was purchased from market and evaluate their results like general appearance shape size and hardness friability weight variation drug content and percentage drug release. Tablets were a white colour oval shape and strength is 600 mg tablets. This less than 10 Kg/cm2 friability not more than 1% and Disintegration time 60 seconds and drug content was found to be more than 80% and % Linezolid release pattern follow first order kinetics all the generic tablets are showing the same results compared with Branded tablets.

Keywords: Linezolid, oral drug delivery, generic, branded

Revolutionizing Genetics: Advances in Gene Editing Technologies and Their Global Implications

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Abstract:

Gene editing technologies have emerged as powerful tools for precisely modifying DNA sequences, offering new opportunities to treat genetic diseases, develop new biotechnologies, and improve crop yields. The most widely used gene editing technology is CRISPR-Cas9, which uses a molecule called RNA to target and cut specific DNA sequences. This approach has been used to create genetically modified organisms, study gene function, and treat genetic diseases in animal models. However, there are also newer gene editing technologies that are being developed, such as prime editing and base editing. Recent advances in the development of programmable nucleases, such as zinc-finger nucleases (ZFNs), transcription activator-like effector nucleases (TALENs), and clustered regularly interspaced short palindromic repeat (CRISPR)-Cas-associated nucleases, have significantly accelerated the transition of gene editing from concept to clinical practice. We cover the uses of the three primary genome editing technologies (ZFNs, TALENs, and CRISPR/Cas9) and their derivative reagents as gene editing tools in diverse human disorders and potential future therapeutics, with a focus on eukaryotic cells and animal models. Therefore, this study presents an overview of clinical studies using genome editing platforms for disease therapy, as well as some of the hurdles associated with its implementation.

Keywords: Gene editing, disease therapy, CRISPR, functional genomics, therapeutics

Comparative Study and Qualitative Phytochemical Screening of Different Extracts of *Psidium guajava* Leaf

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Abstract:

This Research is a comparative analysis of several extracts of *Psidium guajava* leaves, as well as a comparison of phytochemical screening among all extracts (Aqueous, Methanolic and Ethanolic Extracts of *Psidium guajava*). Fresh leaves of Psidium guajava were collected and shade dried for 10 days, and dried leaves were subjected to size reduction and passed through sieve no. 40. Aqueous extract was prepared by the decoction method, while ethanolic and methanolic extracts were prepared by maceration. The presence of phytoconstituents was found to be more in aqueous extracts as compared to ethanolic and methanolic extracts. The percentage yield of aqueous extract was much better as compared to both methanolic and ethanolic extracts. The results of the qualitative phytochemical analysis showed that the leaf's aqueous extract contains several secondary plant compounds with significant therapeutic efficacy, which can be used as a basic medicine quality control and authentication measure.

Keywords: *Psidium guajava*, phytoconstituents, methanolic extract, ethanolic extract, aqueous extract

NLC: A Promising Drug Delivery Platform

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Abstract:

The use of lipid-based nanoparticle drug delivery systems has garnered attention in recent years due to their features like biocompatibility and lipophilic properties. Among these nanoparticles, nanostructured lipid carriers (NLCs) have proven to be superior to other nanocarriers due to their numerous advantages. NLCs consist of solid and liquid lipids, surfactants, and water. NLCs are second-generation lipid nanocarrier with improved physical stability, drug loading, permeability, and bioavailability, as compared to traditional lipid-based nanocarriers like nanoemulsion, liposomes, and solid lipid nanoparticles (SLNs). NLCs possess excellent potential in the pharmaceutical industry as they offer various benefits like drug targeting, occlusion, and enhanced bioavailability. The key attributes of NLCs that make them a promising drug delivery system are their improved drug loading, stability, ease of preparation, biocompatibility, scalability, and non-toxicity. NLCs have three main types: imperfect, amorphous, and multiple, and are formulated using lipids, liquid lipids, solid lipids, emulsifiers, and aqueous medium. This review article aims to cover NLC structure, types, formulation, advantages over first-generation nanoparticles, various formulation methodologies, and characterization of NLCs, which are crucial in formulating a stable drug delivery system.

Keywords: NLC, nanoparticle, lipid, bio-compatibility, surfactants

Synthesis, *in-Silico* Studies and Biological Evaluation of Pyrimidine Based Thiazolidinedione Derivatives as Potential Anti-diabetic Agents

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Abstract:

Despite the advancements in the management of Diabetes mellitus, the design and synthesis of drug molecule which ameliorates the hyperglycemia and associated secondary complications in diabetic patients, still remains a challenge. Herein, we report the synthesis, characterization and anti-diabetic evaluation of pyrimidine-thiazolidinedione derivatives. The synthesized compounds were characterized by 1H NMR, 13C NMR, FTIR and Mass Spectroscopic analytical techniques. The *in-silico* ADME studies depicted that the compounds were within the permissible limits of the Lipinski's rule of five. The compounds 6e and 6m showing the best results in OGTT were evaluated for *in-vivo* anti-diabetic evaluation in STZ induced diabetic rats. Administration of 6e and 6m for four weeks decreased the blood glucose levels significantly. Compound 6e (4.5 mg/kg p.o.) was the most potent compound of the series. It reduced the level of blood glucose to 145.2 ± 1.35 compared to the standard Pioglitazone (150.2 ± 1.06). Moreover, the 6e and 6m treated group did not show increase in bodyweight. The biochemical estimations showed that the levels of ALT, ASP, ALP, urea, creatinine, blood urea nitrogen, total protein and LDH restored to normal in 6e and 6m treated groups as compared to STZ control group. The histopathological studies supported the results obtained in biochemical estimations. Both the compounds did not show any toxicity. Moreover, the histopathological studies of pancreas, liver, heart and kidney revealed that the structural integrity of these tissues restored to almost normal in 6e and 6m treated groups as compared to STZ control group. Based upon these findings it can be concluded that the pyrimidine-based thiazolidinedione derivatives represent novel anti-diabetic agents with least side effects.

Keywords: Diabetes, thiazolidinediones, streptozotocin-induced diabetes, pyrimidine

Targeted Treatment of Psoriasis Using Microneedles: Prospective and Advances

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Abstract:

Psoriasis is a persistent skin condition for which only symptom management is currently available. Topical and systemic medicines, physical therapy, and other methods are all part of the standard treatment strategy. New medication delivery methods for psoriasis are urgently needed because of the present methods' shortcomings. The objective of this article is to provide a comprehensive description of microneedles, as well as their development in the treatment of psoriasis and the clinical challenges associated with them. The microneedle (MNs) technology is better than other transdermal delivery methods because it has so many benefits, include low invasiveness, painlessness, simplicity, and enhanced patient compliance. Coated microneedles, hollow microneedles, dissolving microneedles, and solid microneedles are the four basic categories into which researchers have so far sorted the fast-expanding area of microneedles. Each of these kinds of microneedles offers its own unique advantages due to its unique properties and layout. MNs may significantly improve transdermal medication penetration by mechanically opening skin micropores. Meanwhile, this method demonstrates distinct benefits over injection and oral delivery, such as painless application, the least amount of intrusion, the simplicity of self-administration, and avoiding the first-pass impact.

Keywords: Microneedles, psoriasis, cutting-edges technique, dissolving microneedles, transdermal drug delivery, superficial tumor, scar

Biophysics and Structural Biology: (Chemistry and its Structural Properties)

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Abstract:

Different macromolecules in a biological system serve different purposes. The relationship between their structure and function is intimate. The surroundings also influence the structure. Hence, understanding the structure of macromolecules as well as details about their surroundings becomes crucial. Moreover, there are drugs that affect some of the most basic functions of living things, such as protein manufacturing, nucleic acid replication, and quality articulation, which are often referred to as antibiotics. Hence, understanding the structure and function of the molecules involved in the interaction of these medications at the molecular level is necessary. Spectroscopy, NMR, CD XRD, and other methods are used to make all of this research easier. This chapter provides in-depth information on the many facets of macromolecules as well as the methods used to investigate them.

Keyword: Protein, DNA, RNA, NMR, XRD, CD, alpha helix, beta turn, DNA-drug interaction, DNA-protein interaction

Role of Natural Herbs in the Treatment of Hypertension

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Abstract:

Hypertension is a common problem facing many peoples today. High blood pressure is formally referred to as hypertension (HTN). It is hazardous because, in addition to raising the risk of heart disease and stroke, it puts too much strain on the heart and causes atherosclerosis (arterial hardening). Although billions of dollars are spent annually for the treatment and detection of cardiovascular disease, current conventional treatments have done little to reduce the number of patients with hypertension. Many antihypertensive agents are used like Thiazide, loop, and potassium-sparing diuretics, Calcium antagonists. HTN may result in other conditions like congestive heart failure, kidney disease, and blindness. Because they are easily available and fewer side effect to the human body and, about 75 to 80 percent of the world's population, mostly in developing nations, uses herbal medicines for primary healthcare. Herbs and plants contain many phytochemicals that have been effective in the treatment of CVD and hypertension. Research has found a variety of alternative therapies to be successful in reducing high blood pressure including diet, exercise, stress management, supplements and herbs. There are various herbal medications that can be used safely to treat hypertension, including Punarnava, Barberry, *Rouwolfia*, Garlic, Ginger, Ginseng, Cinnamon and Arjuna.

Keywords: Hypertension, herbs, diuretics, phytochemicals

Natural Herbs in the Treatment of Cancer

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Abstract:

Cancer is characterized by a rapid and uncontrolled formation of abnormal cells, which may mass together to form a growth or tumor, or proliferate throughout the body, initiating abnormal growth at other sites. In India, one in nine people are likely to develop cancer in his/her lifetime. There are therapeutic applications for several of the groups of phytochemicals used in herbal medicine. Treatment with herbal medicine (vinca alkaloids) is to be very beneficial for cancer patients, and chances of survival are frequently greatly increased. Recent studies showed the anti-oxidative and superoxide scavenging activities of individual active components of herbal medicine for their inhibitory activities on lipid peroxidation and anti-cancer properties. For example, Amla has a high antitumor effect, especially with certain cancers such as colon and lung cancer and Cinnamon has been extensively researched for its potential application in cancer prevention and treatment. Tomato also known as cancer fighting vegetable. The benefits of specific herbal medications include antipyretic, analgesic, anti-inflammatory, and anti-cancer properties. Herbal medicine is employed in nutrient supplements for anti-cancer and anti-inflammatory effects in addition to having many therapeutic uses. There have been several reports of *in vivo* and *in vitro* trials of herbal medicine on various cell lines.

Keywords: Cancer, Herbs, anti-inflammatory, antipyretic, analgesic, phytochemicals

Radiotherapy in Cancer Treatment

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Abstract:

Radiotherapy, also known as radiation therapy, is a medical treatment that uses high-energy radiation to target and destroy cancerous cells in the body. The treatment is typically administered over a series of sessions and can involve external beams of radiation or radioactive substances inserted inside the body. Radiotherapy is often used as a primary treatment for cancer or in combination with other therapies, radiotherapy as a cancer treatment. However, radiotherapy also has some limitations and potential side effects like fatigue, skin irritation and nausea. Because the treatment damages healthy cells in addition to cancer cells. Additionally, in rare cases, radiation therapy can lead to the development of secondary cancer. For example, some advanced-stage cancers may be resistant to radiation therapy, meaning that it is less effective in stopping the growth of the cancer cells. Additionally, some cancers may be located in areas that are difficult to target with radiation without causing damage to nearby healthy tissue. In conclusion, radiotherapy is an important treatment option for many types of cancer, and can be highly effective in targeting cancerous cells. With proper planning and collaboration between the patients, their healthcare team, and radiation oncologists, radiotherapy can be a powerful tool in the fight against cancer.

Keywords: Radiotherapy, cancer, radiation

Novel Bioengineering Strategies for Pharmaceutical Delivery

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Abstract:

Many different species have been considered as possible pharmacological biofactories for pharmaceuticals. Multiple hosts might now be used for bioproducts due to the development of biology combined with bioengineering technologies for genome modification. Bioengineering technologies are equally important to grow or enhance metabolites, or which are linked to their increased endurance and boost their bioactivities. A variety of technologies, ranging from antiquated to cutting-edge, are included in bioengineering tools. These include biochips, diatomite nanoparticles, encapsulin, 3D printed microfluids, and others that are essential to the sustainability of the pharmaceutical industry. This review highlighted the drug delivery via biochip using microrobots, oral drug delivery through diatomic nanoparticles as a microcapsule, treatment via bacterial gene and bacterial organelle i.e., encapsulin, microfluidic chips for precision medicine and other smart tactics that the pharmaceutical business is now employing.

Keywords: Bioengineering, delivery, biofactories, encapsulin, microfluid

Soft Robotic Interactive Artificial Muscles

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Abstract:

Artificial muscles have exceptional flexibility for creating actuation in embedded systems. Scientific work on artificial muscles and their use in a variety of fields, including soft robotics and biomedical gadgets, has increased in recent years. Artificial muscles that allow soft robotic systems to change shape, move, and be controlled are the basic building blocks of smart and interactive soft robotic systems. Artificial muscles are the subject of a lot of research. Dielectric elastomer actuators, pneumatic actuators, and other technologies are the basis of this research. Stimuli-responsive polymers, soft magnetic actuators, and electrochemical actuators Recent developments have produced artificial muscles with an outstanding energy capacity approaching that of real muscles, agile shape-morphing behaviour that is programmable and reconfigurable, and extremely high mobility to cross surfaces with obstructions and diverse terrain specular maps. The objective of this work is to present a comprehensive evaluation of current developments in artificial muscle based on different operating principles. We recommend appropriate artificial muscle methods for particular microsystem applications based on the particular application needs as well as the electrical and mechanical characteristics of the muscle types. Based on this, the fascinating possibilities for combining soft electronics with artificial muscles to create intelligent and interactive soft robotic systems are highlighted.

Keywords: Artificial muscle, biomedical gadget's, soft robotic system, microsystem

Various Vaccine Delivery via 3D Printed Microneedle in Transdermal Drug Delivery System

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Abstract:

Microneedle vaccination patches are an exciting new vaccine delivery method. They are made up of a series of small needles that enter the skin and disintegrate, allowing the vaccine to be delivered straight into the body's tissues without the need for a traditional injection. 3D printing is a technique that enables for the precise and accurate production of complex structures. It has been utilised to make arrays of microneedle for vaccine patches, and it has various advantages over typical manufacturing processes. Microneedles of various sizes, shapes, and densities can be created via 3D printing and suited to the individual vaccination being administered. This provides for better control over the vaccine's distribution and may improve its efficacy. Furthermore, 3D printing enables swift prototyping or customization of microneedle arrays, which can be useful in vaccine development and testing. It also has scalability, which means it can generate vast quantities of microneedle arrays rapidly and efficiently. Overall, microneedle vaccine patches based on 3D printing have the potential to revolutionize vaccine delivery by making them more convenient, effective and easily available to patients. More research, however, is required to optimize the technology and verify that its safety and efficacy.

Keywords: Microneedle, vaccine, patches, drug delivery, 3D printing

AF-loaded PLGA Nanoparticle Attenuate Cognitive Deficits in AlCl3-Induced Alzheimer's Disease

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Abstract:

AD, a prevalent ailment worldwide, is age-dependent and has limited therapies that only provide symptomatic relief. Unfortunately, the drugs cannot completely cure AD due to the limited ability to cross the blood-brain barrier**.** Advanced technology has made it possible for nanoparticles to serve as a promising solution to overcome the limitations mentioned above. The purpose of this study was to produce AF NPs and evaluate their potential neuroprotective effects against AlCl3-induced AD in rats. Subsequently, the rats were administered AlCl3 (100 mg/kg, for 21 days), followed by orally administered AF (5 and 10 mg/kg) and AF NPs (2.5 and 5 mg/kg) from the 8th to the 21st day. The behavioral parameters were assessed using the Morris Water Maze (MWM) and locomotor activity. On the 21st day, the brains were extracted for the assessment of biochemical, inflammatory markers, and histopathology analysis. The results indicated that AF NPs effectively reversed all behavioral, restored antioxidant levels, and decreased inflammatory markers induced by AlCl3. Consequently, this study suggests that AF NPs could serve as a promising novel therapeutic approach to slowing down the progression of AD.

Keywords: AF, nanoparticles, AD, neuroinflammatory, oxidative stress

Fosdenopterin: Lifesaver in the Rare Disease Molybdenum Cofactor Deficiency Type-A

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Abstract:

For the treatment of rare diseases, orphan drug discovery is extremely challenging. Most rare diseases don't have any reliable treatments. An uncommon condition called molybdenum cofactor deficiency is what gives newborn babies neurological disorders. Due to a genetic change in MOCS1 (Molybdenum Cofactor Synthesis 1), guanosine triphosphate cannot be converted into cyclic pyranopterin monophosphate (cPMP). Sulfite which is neurotoxic accumulates in the brain and damages neurons. Reduction of sulfite oxidase (SOX) function, one of four Moco-dependent enzymes in men, is the condition's underlying biological aetiology. S-sulfocysteine and thiosulfate are two more metabolites that are increased as hazardous sulfite builds up, while cysteine and cystine's oxidised form are decreased. The first medication created by Origin Biosciences for the treatment of MoCD type-A is called fosdenopterin. In recent years, the Food and Drug Administration gave it its approval. Cyclic pyranopterin monophosphate, or fosdenopterin, is a synthetic compound. The rates of morbidity and mortality associated with MoCD are decreased with fosdenopetrin. So we conclude that due its rarity of adverse effects, it is a blessing for the people with MoCD.

Keywords: Molybdenum cofactor deficiency, fosdenopterin, cyclic pyranopterin monophosphate, sulfite

Formulation and Optimization of Eplerenone Gastro Retentive Tablet Using Box-Behnken Design

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Abstract:

The purpose of this research is to develop and optimize a novel gastro-retentive tablet of Eplerenone which has short half-life of 4-5 hrs, and to study the maximum drug release up to 12 hrs. by designing the amount of polymer by Box-Behnken design with three factors to optimize the composition i.e., Sodium bicarbonate (X1), HPMC K15M (X2), and Carbopol 934p (X3). The design suggested 15 formulations of different concentrations of X1, X2, and X3, and their effect was monitored on Y1, Y2, and Y3. Formulations were evaluated for physical characterization hardness, friability, weight variation, content uniformity, buoyancy studies, and floating lag time (Y1), *In-Vitro* drug release study at 6 hr (Y2) and *In-Vitro* drug release studies at 12 hr (Y3). The design suggested an optimized composition of 73.2 mg of X1, 100 mg of X2, and 5.0 min of X3 for selected constraints of Y1, Y2 and Y3 responses and Optimized composition follow the first-order kinetics (R2 = 0.9843) and stable at 40 °C/75% RH for 6 months.

Keywords: Eplerenone, gastro retentive tablet, box-behnken design

Molecular Docking Studies of Some 2-Oxoquinoline Based Thiosemicarbazone Derivatives as Antimalarial Agents

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Abstract:

Malaria still threatens global health seriously. While the current discoveries of antimalarials are almost focused on single mode of action inhibitors, multi targeting anti-malarial agents are highly desired to overcome the increasingly serious drug resistance. In the present study, a series eighteen 2-oxoquinoline based thiosemicarbazone derivatives were subjected to molecular docking on *P. falciparum* Lactate Dehydrogenase enzyme (PDB code: 1CET, resolution 2.05 Å) and PfDHFR-TS, a *P. falciparum* dihydrofolate reductase (PDB code: 3QG2, resolution 2.3Å) using Autodock 4.2.6. Molecular docking studies revealed that the most active compounds TS-2, TS-4, TS-5, TS-6, TS-8, TS-9, TS-10, TS-11, TS-16, TS-18 docked well within the binding sites of P. falciparum Lactate Dehydrogenase drug target having binding energies ranging from -10.13 to -6.53 kcal/mol. Hydrogen bond interactions were observed with His195, Phe52, Phe100 while π-π interactions were seen with Ile54 and Ala98. Whereas in the active site of PfDHFR-TS enzyme displayed hydrogen bond interaction with the residues Leu164, Cys15, Asp54, Ile14 with binding energies ranging from -9.43 to -6.48 kcal/mol. For all the designed compounds, the binding energies of molecular interaction into the active site of enzymes were found to be better than co-crystallized ligand, chloroquine (-6.00 kcal/mol) Pyrimethamine (-6.39 kcal/mol) respectively.

Keywords: Thiosemicarbazone, molecular docking, chloroquine, pyrimethamine, *P. falciparum* lactate dehydrogenase, *P. falciparum* dihydrofolate reductase thymidine synthase, antimalarials

Effectiveness of Estrogen and its Derivatives Over Dexamethasone in the Treatment of COVID-19

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Abstract:

Coronavirus disease (COVID-19) is an infectious disease caused by the SARS-CoV-2 virus and dexamethasone is a glucocorticoid widely used for its treatment. Dexamethasone is not used in non-severe cases due to its immunosuppressant action. So, considering this, Estrogen and Estetrol were tested for the treatment of COVID-19 as they all possess a common steroid ring and dislike dexamethasone, they are immune enhancer. Virtual screening of test ligands was performed through molecular docking, MM-GBSA, simulations, *in silico* ADMET and drug-likeness prediction to identify their potential to inhibit the effects of SARS-CoV-2. Results showed that test ligands possess drug-like properties and they are safe as drug candidates. The protein-ligand interaction study revealed that they bind with the amino acid residues at the active site of the target proteins and the test ligands possess better binding potential than Dexamethasone. With protein M pro , Estetrol and Estrogen showed docking score of -7.240 and -5.491 kcal/mol, and with protein ACE2, Estetrol and Estrogen showed docking score of -5.269 and -4.732 kcal/mol, respectively. Further, MD Simulation was carried out and most of the interactions of molecular docking are preserved during simulation. The prominent interactions that our test ligands showed during MD Simulation are similar to drugs that possess *in vitro* anticovid activity as shown in recent studies. Hence, our test ligands possessed potential for anticovid activity and they should be further tested through *in vitro* and *in vivo* studies for their activity against COVID-19.

Keywords: COVID-19, SARS-CoV-2 virus, immunosuppressant, anticovid activity

Phytochemical Analysis of Bioactive Phytoconstituents for Targeted Delivery Loaded in Elastic Vesicular Carrier System for the Treatment of Rheumatoid Arthritis

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Abstract:

In the past few years, transdermal medication delivery has emerged as the most advantageous method. It overcame many drawbacks associated with the oral route of drug administration, the most advantageous route limitation being first-pass metabolism. Although a transdermic delivery system has been created, some drugs; particles are unable to effectively penetrate the stratum corneum, which presents challenges for drugs that can be administered via this route. Our scientists and researchers have created a novel system known as an elastic vesicular carrier system. RA is the most common type of Arthritis nowadays. There are various factors are there which are responsible such as age, body mass index, and other disease activities. 0.75% of the Indian population is suffering from arthritis among these the most common is Rheumatoid Arthritis and Osteoarthritis. Nowadays scientists and researchers are more focused on nanomedicine for the treatment of arthritis. They are aiming for synthetic drugs loaded in nanoparticles to easily target the arthritic site in the patient suffering from Arthritis. But the nanoparticles loaded with synthetic drugs have some drawbacks such as drug adverse effects. To overcome these limitations plant-based medicines have received a lot of attention in recent years. The current research work on herbal drugs has mostly focused on different phytoconstituents which can be used for the targeted drug delivery for the treatment of Rheumatoid Arthritis. In this research, it is concluded that the ethanolic extract of *Curcuma long*, *Berberis aristata* and *Tinospora cordifolia* is a rich source of curcumin, berberine, and tinosporine and contains several important phenolics compounds to easily manage rheumatoid arthritis symptoms.

Keywords: Rheumatoid arthritis, phytochemical analysis, bioactive phytoconstituents, targeted delivery

Drug Discovery and Development

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Abstract:

Large number of diseases are increasing and affecting a large population in these days. They are affecting people's health and their life. So, it is major responsibility of medicinal chemist to research new drugs to maintain health and life of population. Progress of a country depends upon the health of the people. Drug discovery includes many processes like target identification validation, hit identification, lead generation, optimization and finally the identification of a candidate for further development. Development includes optimization of chemical synthesis and its formulation, toxicological studies in animals, clinical trials and regulatory approval. Development of a drug from initial stage to its entry into market is very complex procedure which can take around 10-15 years and cost $1.7 billion. Due to which scientific and operational issues involved in development process can improve efficiency of the work. Hence, there is a need for innovative approaches as well as increased collaboration between industry, academia and government to deliver quality medicines. An awareness of these issues allows the early implementation of measures to increase opportunity for success in discovery and development of targeted drugs.

Keywords: Drug discovery, disease, hit identification, clinical trial

Green Synthesis of Silver Nanoparticles by Using Ultrashort Peptide Hydrogelator: Characterization and Evaluation of Their Antimicrobial Activity

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Abstract:

Silver nanoparticles (AgNPs) are one of the most researched and promising candidates for novel and effective application as an antimicrobial agent. However, the use of toxic and hazardous reducing agents limits the clinical applications of AgNPs and inspire us to develop a green synthesis methodology of AgNPs. In this work, we proposed to develop an *in-situ* approach for synthesis of AgNPs inside ultrashort peptide hydrogels using a photochemical synthesis, without adding any toxic reducing agents. Here, we have prepared a tetrapeptide as an ionic complementary sequence (KLDL) from KLD-12 peptide (known for tissue engineering) that has modified at the N-terminal and studied the self-assembly and hydrogelation behavior in aqueous solutions. The formed hydrogels were characterized by gel inversion assay, HR-TEM, FT-IR and LC-MS analysis. Structure-gelation relationship studies revealed the importance of π-π interactions in self-assembly and hydrogelation of peptide sequences. Interestingly, the peptide hydrogel has shown moderate antibacterial activity alone, whereas in combination with silver ions it showed a synergistic antibacterial activity against methicillin resistant *S. aureus* (MRSA) and *E. coli*. Moreover, this hydrogel is compatible with human blood and mammalian cell lines up to hydrogelation concentrations. This characteristics of the AgNPs loaded hydrogel proves its potential of wound healing activity. Overall, the objective of the current work was to develop a simple and non-toxic biodegradable hydrogel which can be used as biocompatible reducing agent for synthesis of silver nanoparticle for antibacterial hydrogel preparations against infected wounds.

Keywords: Self assembled peptide, antibacterial hydrogel, silver nanoparticle

Herbal Treatment of Skin Disease

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Abstract:

People of all ages can get skin disorders, which are the most prevalent type of infection. One of the most difficult diseases to adapt to is skin problems because of their unpleasantness and related difficulties, especially when they affect the face, which is impossible to disguise even with makeup. The skin conditions are common everywhere in the world. One of the most common causes of skin cancer and other related injuries is the sun. Today, more people than ever before use herbal supplements. In search of novel approaches to bettering their health, people are increasingly turning to herbal therapies rather than prescription medications. A significant portion of this research provides compelling evidence that using herbal supplements in addition to a healthy diet and way of life can be advantageous. As a result, a lot of people take natural health supplements to treat a variety of illnesses and to enhance overall wellbeing. Skin conditions are the cause of a considerable deal of sorrow, suffering, disability, and monetary loss. Fortunately, thanks to recent developments, cutaneous scars can now be effectively removed via skin grafting, laser therapy, and plastic surgery. The significance and benefits of some medicinal plants in treating various skin conditions have been addressed in this review article.

Keywords: Herbs, skin, cutaneous, phytochemicals

Spectroscopic and Cytotoxic Characterization of Novel Synthesized Dimethoxyquinazoline-4-amine Derivatives as Anti-proliferative Agent

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Abstract:

Solubility and UV Spectroscopy analysis data provide useful information for designing of pharmaceutical dosage form and drug discovery process. The biopharmaceutical classification of drugs is also based on solubility and permeability. This study is also important for evaluation of novel biologically active compounds. The bioavailability of any compound is also influenced by solubilisation factor. In this study, some novel quinazoline derivatives were studied with the help of solubility, UV spectroscopic analysis and *in-vitro* cytotoxicity screening. The solubility of the synthesised compounds was determined in solvents: methanol, ethanol, acetone, ethyl acetate, chloroform, dimethylsulfoxide (DMSO), glacial acetic acid, n-hexane, cyclohexane, diethyl ether, benzene, toluene and water followed by preparation of saturated solution in the solvents that showed good solubility of synthesized compounds (SERB-111, RDPP-1-10,). The solubility of synthesized compounds (SERB-111, RDPP-1-10,) was different in different solvents. In some solvents, the compound (SERB-111) showed discrete peaks for λ max (236) that revealed the presence of compounds. The IC 50 value was for the chemical SERB-111 in an *in-vitro* assay 7.95 µg/mL, indicating that it was a strong inhibitor of tumor cells.

Keywords: Anti-proliferative activity, quinazoline, solubility, UV spectroscopy

Significance Role of Shankhpushpi (*Convolvulus pluricaulis*): An Herb for Treating Neurodegenerative Disease that Enhances Cognitive Function

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Abstract:

A neurological condition is one of the largest threats to society and economy. Some of the more than 600 conditions that count in them like memory loss, seizure disorders, headaches, neuro-infections, spinal muscular atrophy, and neurodegenerative disease. Shankhpushpi, also referred to as *C. pluricaulis* Choisy, is a well-established herb that is previously used as a traditional folk treatment for a variety of diseases. It is also recognized by its scientific name *C. microphyllus* Sieb or *C. Prostratus* Forsk. It is mostly used as a memory booster and brain stimulator. Additionally, Indian traditional medicines are utilized for treating central nervous system conditions like stress, sadness, and insomnia. Anxiolytic, neurological (Alzheimer, Huntington, Epilepsy, as well as a depressant), antioxidant, analgesic, immunomodulatory, antibacterial, antihyperlipidemic, as well as cardioprotective effects are only a number of the therapeutic properties of this plant that have been connected to them in history publications. Consequently, locating and providing scientific support for herbal medicines aids in the advancement of Ayurvedic/Unani studies. The therapeutic properties of this plant have been previously associated with several naturally occurring phytoconstituents, such as the alkaloids (Convolamine), flavonoids (Kaempferol), or polyphenolic substances (Scopoletin, β-sitosterol, as well as ceryl alcohol). The antianxiety and also CNS-depressant activities of Shankhpushpi may be explained by a number of these active ingredients, including Scopoletin, kaempferol phytosterol, or β-sitosterol, which was isolated from *C. pluricaulis* flying segments. We used network pharmacology, PubMed, Google Scholar, and Web of Science to conduct an electronic search on *C. pluricaulis* to gather the data for this article.

Keywords: Shankhpushpi, *Convolvulus pluricaulis*, alzheimer, parkinson, epilepsy, anxiety, scopoletin

Evaluation of Solid Lipid Nanoparticles for Dibucaine Sustained Release

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Abstract:

Dibucaine (DBC), a potent long-acting local anaesthetic (LA), is one of the most toxic LAs. In recent years, SLN have been successfully effectively created as prospective systems for drug delivery. We investigated solid lipid nanoparticles (SLN) made from two different lipid matrices and produced by two different hot-emulsion techniques: the high-pressure method and sonication. The stability of the colloidal particles of the SLN formulations was examined for 240 days at 4 °C in terms of particle size (nm), polydispersity index (PDI), and zeta potential (mV). The effectiveness of the DBC encapsulation process was evaluated using the ultrafiltration/centrifugation method. Effective pain management is one of medicine's most challenging issues. The formulations were created to give dibucaine a fresh, topical or intravenous delivery route. For a long time, the pharmaceutical industry has used lipid components that are solid at room temperature to create various formulations, including emulsions, lotions, ointments, and suppositories. Because the stratum corneum's lipid-rich intercellular region has a strong affinity for these substances, for many medications, oral consumption is the preferred route since it offers a good way to get both local and systemic effects. SRDDS was created to gradually wean users off of drugs while minimising unwanted effects by maintaining a constant drug dose for a predetermined amount of time. The core theory behind SRDDS illustrates how a drug's pharmacokinetic, pharmacodynamic, and biopharmaceutical actions work together to maximise its value, lessen its adverse effects, and control disease. The sustained release tablets, their justification, difficulties, benefits, and drawbacks, as well as the numerous polymers utilised in their manufacturing, are the focus of this review's main discussion. This system is simple to use and may be designed to treat a variety of conditions, which increases patient compliance.

Keywords: Dibucaine, solid lipid nanoparticles, local anaesthetic, centrifugation, hot-emulsion technique

Pharmacological Evaluation of Plant Extract for Anti-Hyperlipidemic Activity

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Abstract:

Traditional medicines like *Bacopa monnieri* (L.) Pennell have been used for centuries to treat a wide range of illnesses and medical issues, including improving memory. In Ayurvedic medicine, it is usually referred to as "Brahmi," and it is widely used in India to improve memory. Triterpenoids, saponins, alkaloids, glycosides, and alcohols were present in the Brahmi extract. The alkaloids "brahmine," "nicotine," etc., are derived from Brahmi extract. *Bacopa monnieri* has a wide range of pharmacological effects, including those on the central nervous system (memory improvement, antidepressant, anxiolytic, anticonvulsant, and antiparkinsonian), the gastrointestinal tract, the endocrine system, the immune system, antimicrobials, anti-inflammatory agents, analgesics, and the cardiovascular system. The current review concentrated on the pharmacological properties and chemical make-up of *Bacopa monniera*. One of the primary risk factors for the development of coronary heart disorders is hyperlipidemia. This is a medical disorder when the blood has unusually high quantities of plasma lipids like phospholipids, cholesterol esters, and triglycerides. Numerous anti-hyperlipidemic medications, including statins and fibrates, are used to treat significant plasma lipids. Total cholesterol (TC) and its derivatives, including triglycerides (TAG), low density lipoprotein (LDL), high density lipoprotein (HDL), and very low density lipoprotein (VLDL), can be used to classify the lipids.

Keywords: Antidepressant activity, antihyperlipidemic activity, antioxidant activity, antiparkinson activity

Exploring the Potential of Non-Steroidal Anti-inflammatory Drugs Conjugated Ultrashort Peptides as Antibacterial Agents

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Abstract:

Antibiotics were once considered a "magic-bullet" for treating infections, but their efficacy against multidrug-resistant (MDR) pathogens has been compromised due to bacterial adaptations and mutations. The development of new antibiotics with novel targets and modes of action is essential to overcome this crisis. Among the new classes of antibiotics, antimicrobial peptides (AMPs) have emerged as a promising candidate due to their unique mechanism of action and low propensity for resistance. Non-steroidal anti-inflammatory drugs (NSAIDs) are a class of drugs commonly used for the treatment of pain, inflammation, and fever. While they are not typically prescribed as antimicrobial agents, recent research has shown that some NSAIDs can exhibit antimicrobial activity against a wide range of microorganisms, including bacteria, fungi and viruses. In this work we are combining AMPs and NSAIDs together by conjugation for finding of therapeutically viable antimicrobials. In this line of thought we have chosen an ultrashort peptide motif "H 2 N-Orn-Orn-Trp-Trp-CONH 2" (OOWW) which N-terminal was modified with NSAIDs hydrophobic acids. All peptides/peptidomimetics synthesized using the solid-phase peptide synthesis technique and evaluated against gram-positive and gram-negative bacterial strains including clinically relevant MDR pathogens. The designed peptides have shown their potency against both Gram-positive and Gram-negative strains, with MIC ranging between 0.9-31 mM in concentration & cytotoxicity against hRBC lies above 250 mM concentration. The designed peptides have shown great potential in terms of its antimicrobial potency and non-cytotoxic efficacy.

Keywords: Antimicrobial agents, non-steroidal anti-inflammatory drugs, MRSA, antimicrobial peptides

Experimental Evaluation of Anticonvulsant Activity from Plant Extract

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Abstract:

The goal of the current investigation has been undertaken the ethanolic leaves extract of Annona Squamosa have anticonvulsant properties. The Ayurvedic herb *Annona squamosa*, which belongs to the Annonaceae family, is well-known for its major medicinal characteristics. Annona Squamosa leaves Known for their wide range of phytochemicals. *Annona sqaumosa* leaves have been studied for their health benefits. These compounds include phenolic compounds such as proanthocyanidins, which contain 18 different phenolic compounds, mainly alkaloids and flavonoids. *Annona squamosa* leaves (ASL) extracts have been studied for their biological activities, including anticancer, antidiabetic, antioxidant, antimicrobial, antiobesity, lipid-lowering, and hepatoprotective effects. The *Annona squamosa* plant has been unleavened as a natural medicine as well as in several other food applications, for example its pulp is used as a flavoring in ice cream and 50-80% of the *Annona squamosa* fruits is edible and can be ground into juice. Epilepsy is a relatively common neurological disorder. Approximately 5-10% of the population will have at least one seizure, with the highest incidence occurring in early childhood and late adulthood. Experiments were conducted following standard procedure. The antioxidant and anticonvulsant qualities of *Annona squamosa* leaves with extract were assessed *in vivo* and *in vitro*. These results might support the use of this plant in epilepsy treatment, as a standard medication is employed in procedures.

Keywords: *Annona squamosa*, anticonvulsant, anticancer activity, antiobesity, chemical constituents

The Screening Diagnosis Treatment and Follow-Up of Cancer

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Abstract:

Today, the most prevalent life-threatening condition brought on by our way of life is cancer. Uncontrolled cell development is what causes cancer, which is treatable if detected early on. The different internal and external elements that produce cancer affect cancer treatment. By 2030, it's anticipated that 22.2 million new cases of cancer would have been discovered. Cancer is a hereditary disease characterised by uncontrolled cell proliferation that can spread to other parts of the body. It is brought on by genetic or epigenetic alterations in somatic cells. Prostate, breast, lung, stomach, colon, and rectal cancers are the most prevalent malignancies worldwide, along with non-melanoma cancers, although 100 cancers harm people. Every day, there are dramatically more cases of cancer. In this review article, we attempt to clarify many elements that contribute to the development of cancer, its type, how it manifests, its warning signs or symptoms, diagnostic procedures, cancer treatments, and problems associated with those procedures. Precision medicine is currently the subject of extensive research with the goal of improving cancer therapy in the future. The most frequent forms of treatment are chemotherapy, radiation therapy, immunotherapy, surgery, hormone therapy, and combinations of these. The finest anti-cancer treatment is also a stem cell transplant, but it is only performed after general treatment to assist the patient recover from blood loss and improve their health.

Keywords: Awareness, cancer, demographics, risk factor, screening

Coronavirus Disease 19 (COVID-19)

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Abstract:

Coronavirus illness 19 (COVID-19) is a highly contagious and dangerous viral infection brought on by the SARS-CoV-2 coronavirus, which has caused a global pandemic and tragic human fatalities around the globe. Bats may be a potential major reservoir for SARS-CoV-2 because genome study has revealed that it is phylogenetically related to severe acute respiratory syndrome-like (SARS-like) bat viruses. Rapid human-to-human transmission has been amply demonstrated, but the intermediate origin and source of its transmission to humans are unknown. There is no clinically approved antiviral medication or vaccine available for use against COVID-19. However, various broad-spectrum antivirals for COVID-19 have been tested in clinical studies, leading to improvements in the condition of patients. In this review, the emergence and pathogenicity of the COVID-19 infection are summarised and compared to those of earlier human coronaviruses, such as the Middle East respiratory syndrome coronavirus (MERS-CoV) and the severe acute respiratory syndrome coronavirus (SARS-CoV). We also go into strategies for creating efficient vaccines and drug combinations to fight this virus outbreak. We have seen the rise of two zoonotic, extremely pathogenic HCs over the past 15 years.

Keywords: Coronavirus, SARS-CoV-2, bat virus, MERS-CoV

Recent Progress in Hydrocarbon Stapled Antimicrobial Peptides: A Promising Strategy Against Antimicrobial Resistance

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Abstract:

Antimicrobial drug resistance is a major global health threat, and it can occur in bacteria, viruses, fungi, and parasites. The emergence of antimicrobial-resistant strains of bacteria has been fueled by the overuse and misuse of antibiotics, leading to the development of superbugs that are resistant to multiple classes of antibiotics. As an answer of increasing resistance antimicrobial peptides (AMPs) are reporting as promising alternative. They have broad-spectrum activity and usually small and cationic, with a net positive charge that allows them to interact with negatively charged microbial cell membranes. They can disrupt the microbial membrane integrity which makes these less frequent of resistance development in microbes. However, there are still challenges to be addressed in the development of AMP- based therapies, such as optimizing their stability, reducing toxicity, and improving their pharmacokinetic properties. Hydrocarbon stapling of antimicrobial peptides are considering as an important strategy towards improving stability and pharmacokinetic properties of AMPs by covalent cross-link between two nonadjacent amino acids using a hydrocarbon staple. This cross-link forms a rigid, alpha-helical structure that enhances the peptides stability, cell membrane permeability, and binding affinity to target proteins. This review article describes recent progress on hydrocarbon stapled antimicrobial peptides reported in last five years with respect to improved drug-like properties.

Keywords: Antimicrobial peptides, antimicrobial drug resistance, antibiotic, AMP- based therapy

3D QSAR Modeling and Pharmacophore Based Virtual Screening of Phytochemicals for Antimicrobial Activity

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Abstract:

Antimicrobial resistance is the foremost global health concern. The abuse of antibiotics in the healthcare, veterinary, and agricultural sectors, their incorrect prescribing, unwarranted use, and inadequate hospital hygiene practices have contributed to the rise of antibiotic resistance. To combat the current situation, the identification of novel antimicrobial agents is essential. In this study, a 3D QSAR model from sixty-one chalcone derivatives was derived using the Phase module of Maestro software. The five-point model AAARR.38 had an R2 of 0.81 and a Q2 of 0.71. This model was used to screen 339 phytochemicals from the IMPPAT (Indian Medicinal Plants, Phytochemistry, and Therapeutics) database, 5,284 phytochemicals from the TIP db (Taiwan phytochemical database), and 133 phytochemicals from Sigma Aldrich. The screening resulted in the identification of 93 hits from IMPPAT, 1000 hits from TIB db, and 78 hits from Sigma Aldrich. TIP010655 from the TIB db had a maximum fitness score of 2.092; from the IMPPAT database, compound CHEMSPIDER_16498850 had a maximum fitness score of 1.752; and from Sigma Aldrich, Q4951_SIGMA obtained a maximum fitness score of 1.726. These compounds are being procured to carry out biological evaluations on the ESKAPE pathogen panel.

Keywords: 3D QSAR modeling, pharmacophore, virtual screening, phytochemicals, antimicrobial activity

Cyanopyrimidine Derivatives as Potential Anticancer Agents: Design, Synthesis and Evaluation

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Abstract:

Cancer is a widespread disease characterized by uncontrolled cell growth caused by deregulation of cell division control enzymes and proteins. According to the World Health Organization, cancer is the second leading cause of death worldwide, with over 10 million new cases reported in 2020 alone. Despite the progress made in cancer treatment, many challenges still need to be addressed, such as drug resistance, recurrence, adverse effects, and toxicities. To tackle these challenges, there is an urgent need for the discovery of novel anticancer agents with high therapeutic indices. Lysine-specific demethylase 1 (LSD1) is an enzyme that has been found to be upregulated in various cancers and is involved in several cellular processes, including cell proliferation, differentiation, stem cell biology, and malignant transformation. Inhibition of LSD1 has been shown to inhibit cell proliferation, migration, and invasion *in vitro* and *in vivo*, as well as improve anti-tumor immunity and checkpoint inhibition. We conducted molecular docking of 12 compounds against LSD1 using Glide Module from the Schrodinger software suite, with all compounds demonstrating dock scores ranging from -6.5 to -8 kcal/mole. The compounds were synthesized using multiple reaction protocols, and their structures were elucidated using various spectroscopic techniques (NMR, IR, MS). The synthesized compounds were then evaluated for their anticancer activity against 60 cancer cell lines by the National Cancer Institute (NCI) in the United States. All the compounds exhibited potent anticancer activity against most of the cancer cell lines, and eight of them were selected for the five-dose assay by the NCI. Until now, the NCI has produced the results of only three compounds (with half-maximal inhibitory concentrations against most of the cancer cell lines in the nano-molar and sub-micromolar range), and the results are highly encouraging. We plan to evaluate the anti-LSD1 activity and antiproliferative activity of the compounds using other assays, once all the five-dose results are provided by NCI. We believe that our research will be a breakthrough in cancer research and could lead to the development of effective and safe anticancer agents with high therapeutic indices.

Keywords: Cancer, cyanopyrimidine derivatives, anticancer, spectroscopic techniques, molecular docking

Molecular Docking and Dynamics Guided Development of mTOR Inhibitors Using *in silico* Drug Repurposing Approach for Cancer Disease

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Abstract:

Cancers are reported to be one of the leading causes of death globally. About 10 million deaths from cancer are recorded each year. Of 18 million reported cancer cases, 9.6 million deaths were reported in 2018. However, several drugs like Cladribine, Clofarabine, Fludarabine, Nelarabine, Duvelisib, and Idelisib as promising chemotherapeutic agents, manage the disease. The mammalian target of Rapamycin (mTOR) is important, and drugs like Temsirolimus and Everolimus have pharmacological potency but with pronounced toxicity. So, we choose this major target mTOR for the virtual screening of US-FDA-approved drugs for its repurposing using the *in silico* method. The protein mTOR with small molecule inhibitor and the US-FDA approved drug molecules (from the Zinc database) were first imported and prepared using Protein Preparation Wizard and LigPrep, respectively, followed by molecular docking, ADMET analysis, and prime MMGBSA. After that, the drugs were shortlisted according to dock score, ADMET parameters, and MM GBSA ΔG binding score. Two of the most promising molecules were chosen for molecular dynamics simulation. Finally, the bioisosteric replacement was used to improve the ADMET properties of these molecules. This research provides an idea for drug exploration and computational tools for drug discovery in treating cancer disease.

Keywords: Cancer, molecular docking, dynamics, mTOR inhibitors, drug repurposing

A Review on Ethosomes

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Abstract:

The most easily adaptable part of the body is skin. Transdermal drug delivery system is self- reliant of a dosage form which, when applied to the outer layer of the skin. The main objective of this review is to cross the drug through the stratum corneum by transdermal drug delivery system. Transdermal route is an alternative to deliver a drug into the blood. Ethosomes are the most progressive approach with for the better penetration of drugs into deeper layer of the skin. This study is only based on the drug delivery by the transdermal route. It is a self-contained, distinctive dosage form which deliver the drug through the skin at a controlled manner to the circulatory system after applied to the skin. Ethosomes are advanced and non-invasive carriers for the drug delivery which is intended for their proficient transport of drugs. They are easy to prepare, safer and effective when prepared in combination. It has a high influence on their therapeutic application. This review article gives a detailed information about the ethosomal system, structure, advantages, disadvantages, composition, mechanism, types, method of preparation and characterization method of ethosomal formulation.

Keywords: Skin, transdermal drug delivery system, ethosomes, ethanol

Furanone: A Pivotal Scaffold in Medicinal Chemistry

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Abstract:

Heterocyclic compound plays a significant role in medicinal chemistry due to their broad range of biological activities and thus, are exhaustively explored by researchers in the field of drug design and development. 2(5H)-furanone, a five-membered hetero aromatic ring containing oxygen atom, constitute the building blocks of many natural and synthetic pharmacologically active compounds. 2(5H)-furanone become very potent scaffold having clinical significance and possessing plethora of biological activities such as analgesic and anti-inflammatory, anticancer, anticonvulsant, antibacterial and antifungal, antioxidant, antiulcer, and anti-TB. 2(5H)-furanone analogs have been reported to cause their biological action through different mechanism and pathways. Due to the significant medicinal potential of 2(5H)-furanone compounds, their synthesis and utilization in various fields such as organic synthesis methodology, drug development, and natural product synthesis has gained the interest of numerous researchers in recent times. Thus, the molecules containing 2(5H)-furanone scaffold are considered as one of the important templates for the development of some new lead compounds with good therapeutic profile and minimum adverse effects. The aim of present study is to provide structural insights associated with 2(5H)-furanone and some structural idea for the design and development of some new molecules targeting a variety of receptors and enzymes.

Keywords: Furanone, scaffold, medicinal chemistry, heterocyclic compound, biological activities

Plan and Assessment of Multifunctional and Improvements Responsive Nanocarriers for Designated Remedial Conveyance

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Abstract:

Liposomes are little counterfeit vesicles of round shape that can be made from cholesterol and normal, nontoxic phospholipids. Because of their size and hydrophobic and hydrophilic properties (other than biocompatibility), liposomes are promising frameworks for drug conveyance. Liposome properties contrast significantly with lipid piece, surface charge, size and the technique for planning. Ethanol mixture methodology is one of the more definite systems used to convey little unilamellar liposomes in a fundamental and quick manner. A couple of limits were represented to influence the consequences of this technique, and changes were made to the method to overall the conditions expected to make minimally homogenous liposomes. This is the principal study article to give a more significant cognizance of the ethanol imbuement methodology and the introduced changes. Also, the limits influencing the cycle, for instance, implantation speed, blending rate, mixture opening broadness, lipid centre, osmolality/pH/consistency of the liquid stage, volume of utilized ethanol and its extra aggregate, parts of the reaction vessel, and sort of medicine to be stacked, were analysed in the continuous review. Besides, the limitations and medication uses of the continuous method were similarly analysed.

Keywords: Unilamellar liposomes, natural phospholipids, implanation speed, limitation

Evaluation of the Neuroprotective Potential of Sigma -1 Receptor Agonist in Alzheimer's Disease

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Abstract:

Introduction and Objective: Alzheimer's disease (AD) is a neurocognitive disorder that progresses over time. Other factors that contribute to the disease's progression include synaptic disorders, neuroinflammation, mitochondrial abnormalities, and epigenetic changes, all of which result in the death of neurons. In this investigation, we seek to examine the neuroprotective advantages of S1R agonists as a cutting-edge therapeutic approach for the management of AD. ZINC database compounds that were FDA-approved, non-FDA-approved globally, and investigational medications were subjected to *in-silico* (Molecular docking and dynamics) investigations against the SIR (PDB ID: 6DKI). Studies have shown that S1Rs are linked to higher-order brain functions, particularly cognition, memory, and drug use. S1Rs are mostly found in the mitochondria and plasma membrane of neurons and are only expressed in certain cell types, including oligodendrocytes, microglia, and astrocytes. Sigma receptors don't bind to opiates

Methods: Thirty two wistar rat taken into four groups sham control diseased and treated group. wistar rat are treated by specific dose of ZINC000095619101 (70 mg/kg) for six rats and for another six rats dose of ZINC000095619101 (120mg/kg). that's shows the decrease in neural degradation. The inducing agent for AD is LPS using steolting stereotaxic apparatus.

Results: The drug ZINC000095619101 is potent to use in case of AD. That have greater affinity towards S1R that's stimulate PI3/Akt/Mtor pathway. That's lead to inhibition of pro- inflammatory mediators. This leads to neuronal cell survival.

Conclusions: The present result shown that ZINC000095619101that shows therapeutic effect against AD. This inhibits the recruitment pro-inflammatory mediator thus results in neural cell survival and neuron protection.

Keywords: Alzheimer's disease, neurocognitive disorder, FDA-approved, molecular docking

Recent Innovations in Drug Delivery Systems for Targeting the Brain Tumour

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Abstract:

Due to their rapid growth and poor prognosis, brain tumours continue to be a difficult health challenge even after aggressive surgery, radiotherapy, and chemotherapy are used in clinics. The incidence and mortality rates of brain tumours are 1.6% and 2.5%, respectively, and the average survival time for patients with brain tumours is roughly twenty months. The blood-brain barrier (BBB), blood-brain tumour barrier (BBTB), overexpressed efflux pumps, infiltration, invasion, high tumour cell heterogeneity, drug resistance, and immune escape brought on by tumour microenvironment (TME) as well as cancer stem cells (CSC) are just a few of the obstacles that must still be overcome in the treatment of brain tumours. A promising new method of treating brain tumours uses brain Tumour-targeted drug delivery systems, and this increase drug accumulation in the tumour region and decrease toxicity in healthy brain and peripheral tissue. Since brain tumours differ significantly from tumours developing in peripheral tissues in many ways, it is possible to use potential targets based on constantly changing vascular characteristics along with the microenvironment to enable efficient brain tumor-targeted drug delivery. Recent advances in nanotechnology have paved the way for the creation of nano oncology and the creation of newer therapeutic approaches for the treatment of brain cancer. The review highlights the current developments of various nanomaterials for the efficient delivery of medications for the treatment of brain tumours and emphasises the importance of nanotechnology-based therapies for the investigation of brain tumours.

Keywords: Blood brain barrier, nanotechnology, brain tumour

Anti-implantation Activity of Some Plant Isolated Extracts in Rats

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Abstract:

Objective: This study was aimed at evaluating *Bambusa aurundinaceae*, *Trichosanthes dioica* and *Punica granatum* ethanol extract *in-vivo* for anti-implantation activities.

Methods: The extracted substance was evaluated in comparison to plant extracts labelled as Control (Group-I), Ethanolic extract of *Bambusa arundinaceae* leaves (Group-II), *Trichosanthes diocio* fruit (Group-III), *Punica granatum* seed (Group-IV), and Quercetin (Group-V) had been studied in Twenty-four mature female Wistar rats from a colony were separated into five divisions (06 female rats per group) to explored its anti-implantation activity. The 2% of controls receiving 80 in dilution water have zero implants in the uterus horn on the first day. On the 10th day, however, the implantation site reached 8.21±0.22 statistically after mating and the implantation site dropped by 0.1 percent. In Group: II, III and IV of animals received ethanolic extract of *Bambusa aurundinaceae*, *Trichosanthes diocio* and *Punica granatum* at a dose of 200 mg/kg for 10 days from day 1 of the pregnancy. The control group received intragastrically for ten days from day one to day ten of pregnancy. Each group was received 0.1 ml of 1 percent Chicago blue 6B dye intravenously through a tail vein. The uterus of all the animals was exposed, and the number of implantation sites was counted.

Result: The *Trichosanthes dioica* and *Punica granatum* was showed to reduce the implantation sites by 26.45 per cent and 32.38 per cent at 200 mg/kg. While *Bambusa aurundinaceae* showed minimum percent reduction in implantation sites in comparison to other experimental groups at 200 mg/kg dose that is 7.24% but Maximum percent reduction showed by Quercetin (30 mg/kg) i.e., 37.14. * $P < 0.05$ considering it significant.

Conclusion: A strong anti-implantation activity was observed at the dose level of 200 mg/kg.

Keywords: Anti-implantation activity, *Bambusa aurundinaceae, Trichosanthes Dioica, Punica granatum*

Identification and Isolation of Flavonoid Containing Plant and their Subsequent Incorporation into Polyherbal Formulation and its Evaluation

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Abstract:

Among infectious diseases, viral diseases in particular, remain the leading cause of death in humans globally. A survey-based online survey was conducted on the general population (n-531) of various age groups (13-68) from various countries during the COVID-19 period. According to studies, 71.8 % of people are taking Kadha for combating infection and boosting immunity. Most people (86.1%) think that there is no side effect of kadha while 13.9% think vice versa. The World Health Organization (WHO) estimates that 80% of the worlds population still rely on traditional medicine to maintain their health. Medicinal plants are gaining importance with the increase in herbal use seen recently during the covid 19 pandemic. A plants active phytochemicals are usually present in small amounts, sometimes not enough to provide the desired therapeutics effects. When a single herbal drug used in Ayurveda formulation know as single drug formulation and when more than one herbal drug used in Ayurveda formulation know as Poly Herbal formulation. A variety of phytoconstituents derived from medicinal herbs have been extensively studied for antiviral activity. Out of many phytoconstituents, Flavonoid are well known for its anti-viral action. are naturally occurring poly-phenolic phytochemicals that are found in plants and are responsible for a variety of biological process. Roschek *et al.* described that Flavonoids can attach itself to the surface proteins of virus, Prohibiting the virus from entering the host cells. Some flavonoids act as a transcription blocker and affect the replication process while others hinder the late stages of viral assembly, packaging and release. Flavonoids can also modulate the immune system and reduce the viral load. Therefore, I conclude from the survey and available literature that herbs play significant role against viral infections. Natural-derived compounds constantly become a worthy therapeutics alternative against several diseases, including viral infection.

Keywords: COVID-19, active phytochemical constituents, poly herbal formulation, flavonoids

Aftimoon (*Cuscuta reflexa* Roxb) An Important Herbal Drug in Unani Medicine its Phytoconstituents Pharmacological Properties and Therapeutic uses

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Abstract:

Cuscuta reflexa Roxb is the botanical name of herbal single drug Aftimoon it is an epiphytic parasitic plant belonging to the family Convolvulaceae. It is commonly found in Pakistan, Ceylon, Bangladesh, and in the western Bengal plains of India and throughout Thailand. Approximately 170 or more species known to exist. It has no underground roots and it grows as a new parasite on the host plant hence the name Akashbel (sky-twiner). It contains a variety of alkaloids, glycosides, flavonoids, and other compounds. It contains active compounds such as amarbelin, kaempferol, dulcitol, myricetin, cuscutin, cuscutalin, bergenin, beta-sitosterol, luteolin, tetrahydrofuran derivatives, coumarin and kaempferol. In the Unani system of medicine, this plant is used to treat diseases such as zof-e kabid (liver debility), Waram-e kabid (Hepatitis), sartan (cancer), Amraz-e Dimaghi wa Asabi (diseases of nervous system), Amraz-e Sawdawi wa Balghami (diseases of black bile and phlegm), Junoon (Mania), Malikholia (melancholia), Sara (Epilepsy), Amraz-e jild (skin diseases), Deedan-e Ama (Intestinal Worms), Tap-e kohna (chronic fever), Khafqan (Palpitaion), Nafakh (flatulence), Auram (inflammation) and Wajaul mafasil (arthralgia). It is considered as an anticancer or anti-tumor drug in the Unani system of medicine. Pharmacological properties of this plant have been reported as anticancer, antioxidant, antibacterial, antiviral, antidiabetic, anticonvulsant, anti-inflammatory, antimicrobial, antispasmodic, antihypertensive activities. Various unani compound formulations such as Itrifal Aftimoon, Itrifal Ustukhudus, Itrifal Deedan, Itrifal Ghudadi, Itrifal Mushil, Majoon-e-Ushba and Sufoof-e-Chobchini etc. Throughout information about *Cuscuta reflexa* with a focus on Unani medicine provided in this review, it will also validate the plants numerous effects using pharmacological research that has already been done.

Keywords: Aftimoon, parasitic plant, anticancer, *Cuscuta reflexa*, unani

Approaches to Overcome the Unwanted Effects Induced by Antihypertensive Medication

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Abstract:

A serious and increasingly prevalent health issue around the world is hypertension (HTN), which is referred to as systolic blood pressure (SBP) > 140 mmHg and diastolic blood pressure (DBP)> 90 mmHg. In the entire world, hypertension is the most significant modifiable risk aspect for morbidity and mortality from all causes and is linked to a higher threat of cardiovascular disease (CVD). Though effective medication of hypertension lowers the overall burden of disease and mortality, just over half of individuals with hypertension have knowledge of their condition, and many more who are aware but receive no treatment. The list of antihypertensive drugs has grown significantly over the past several decades, including: Beta-blockers, calcium channel blockers, diuretics, angiotensin converting enzyme inhibitors, along with angiotensin II receptor antagonists are the five the primary pharmacological varieties of hypertension drugs. Their administration may be related to the progression of adverse effects (mostly tachycardia) which is probable leading to in discontinuation to therapy, increased morbidity, as well as morbidity. As a result, some of these medications have been taken off the market. Adverse effects to antihypertensive medicines were reported by Diuretics, calcium channel blockers (CCBs), and angiotensin-converting enzyme inhibitors (ACEIs) accounted for most of the adverse reactions seen, especially frequent micturition, tachycardia and headaches (CCB); excessive micturition and dizziness (diuretics); dry irritating cough (ACEI).

Keywords: Hypertension, calcium channel blockers, tachycardia, adverse effect

An Insight into Medicinal Perspective of Ubiquitous Scaffold: "Quinoxaline"

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Abstract:

In recent years, N-heterocycles have maintained their status as an important core of FDA-approved drugs and medicinally active compounds. Quinoxaline is a nitrogen-containing scaffold that belongs to the family of benzodiazepines and is formed from the fusion of two aromatic rings i.e benzene and pyrazine. Depending on the ring opening strategy of drug design, quinoxaline consists of two fused aromatic rings with various hydrophobic, electronic and bulky substitutions which aided in studying the structure-activity relationships. In the modern scenario, quinoxaline analogs have been reported to bind with a wide range of specific protein targets, depending on the nature and position of substitutions. Quinoxaline analogs have been reported to cause their biological action through different mechanism resulting in plethora of biological activities, including antimicrobial, anticancer, antiepileptic, anti-inflammatory, antioxidant, antidiabetic, etc. This study attempts and addresses the graceful advancements related to quinoxaline-based small molecules including its biological activities, structure-activity relationships. The advancement and potential of quinoxaline hybrids attracted the keen attention of researchers to explore their therapeutic ability against different biological targets. Quinoxaline forms various hybrids and conjugates with thiazole, triazole, oxadiazole, pyrrolizines, pyrazole, etc. The present study will provide comprehensive knowledge on the pharmacological importance of quinoxaline analogues and will serve as an important source of literature for the design and development of novel molecules against various targets, receptors and enzymes.

Keywords: Scaffold, quinoxaline, benzodiazepines, anti-inflammatory, antioxidant, antidiabetic

Thiazolidine-4-one as Ubiquitous Pharmacophore in Medicinal Chemistry: An Insight into its Anti-diabetic Attributes

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Abstract:

The thiazolidine-4-one scaffold has recently emerged as a potential pharmacophore having clinical significance for medicinal chemists. This heterocyclic ring has been reported to possess a plethora of biological activities, including antidiabetic activity that has inspired researchers to integrate this core with different pharmacophoric fragments to design novel and effective antidiabetic leads. The antidiabetic activity has been observed due to the ability of the thiazolidine-4-one nucleus to interact with different biological targets, including peroxisome proliferator-activated receptor γ, protein tyrosine phosphatase 1B, aldose reductase, α-glucosidase, and α-amylase. The present study discusses the mode of action of thiazolidine-4-ones through these antidiabetic drug targets. This study attempts to summarize and analyze the recent developments with regard to the antidiabetic potential of thiazolidine-4-ones covering structure–activity relationships, and docking studies already reported in the literature. The significance of various structural modifications at C-2, N-3, and C-5 of the thiazolidine-4-one ring is also discussed. This study aims to provide an inevitable scope for the design and development of potential antidiabetic drug candidates having a thiazolidine-4-one core.

Keywords: Pharmacophore, medicinal chemistry, anti-diabetic

Extraction, Isolation and Phytochemical Study of Thuja Occidentalis

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Abstract:

Thuja occidentalis (commonly morpankhi) is a genus of coniferous tree in the cupressaceae (cypress family). In this study, *Thuja* occidentalis roots were crushed and extracted with a Soxhlet extractor in two solvent systems, i.e. (E1) ethyl acetate: acetone: ethanol (40:30:30) and (E2) methanol: distilled water (70:30). This study conferred the screening of phytochemical constituents. Standardization of crude drugs extracted from plants plays a vital role in identifying the quality and purity of medications. Current research analysis reveals standardization of crude drugs that includes moisture content, acid-insoluble and water-soluble, and different soluble extraction values were estimated. The highest extractive values were recorded for the water-soluble extract of crude drugs, bioactive substances present in medicinal plants that can lead to drug discovery and development. The present study deals with the phytochemical components of the medicinal plant *Thuja occidentalis* from the Cupressaceae family in order to relate their presence to the bioactivity of the plants. Current research highlights that methanolic extracts of *Thuja occidentalis* had the highest number of phytochemicals compared to other solvent extracts. Therefore, methanolic extracts of *Thuja occidentalis* have the most significant potential to treat various human diseases and have profound medical utility.

Keywords: *Thuja occidentalis*, phytochemical constituents, medical utility

Computer-Aided Drug Design and Discovery

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Abstract:

The process of discovering, a novel medicine in most cases seen as being exceedingly difficult and requiring a significant portion of resources or time. Computer-aided drug design techniques are thus now routinely processed to improve the effectiveness or efficiency of the drug research and development process. Structure-based drug design and ligand-based drug design approaches are known as most effective and probable strategies in drug discovery and development. Various CADD approaches are rated as promising methodologies based on their necessity or growth. Both of these approaches can be used in conjunction with molecular docking for essential lead optimisation and identification. In recent years, the pharmaceutical industry and research fields have made extensive use of computational technologies to increase the effectiveness of the drug discovery and development process. In this review, we provide an overview of computational techniques, a creative method for identifying new significance that support the investigation of drug discovery, drug design and development.

Keywords: Computer aided drug discovery, molecular docking

Curcumin Nanoemulsion Exhibit Antihypertensive Effect via RAAS Inhibition in DOCA-Salt Induced Hypertensive Rats

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Abstract:

Background- Curcumin obtained from curcuma longa is a traditional medicine having various therapeutic properties. But its poor bioavailability limits its use, so its nanoemulsion can be used as a substitute. To determine antihypertensive effect of Nano emulsion of curcumin (SNEC) we evaluated by targeting RAAS and oxidative stress in Deoxycorticosterone acetatete (DOCA) salt induced hypertensive rats.

Methods- The present study performed molecular docking and demonstrated the cardio protective effect of SNEC in DOCA salt-induced hypertension in uninephrectomised rats. Hemodynamic parameters were assessed by AD instrument. Biochemical parameters such as serum angiotensin converting enzyme, angiotensin-II, blood urea nitrogen, and creatinine level were estimated using an ELISA kit while antioxidant parameters were evaluated by chemical method.

Results- The result of molecular docking study showed that curcumin has a greater affinity and appropriate binding capacity for the active site of ACE. Oral administration of SNEC significantly decreased the systolic, diastolic, and mean arterial blood pressure as well as it also decreased LVEDP and increased LV(dP/dt)max when compared with the pathogenic DOCA group. Serum levels of ACE and Ang-II were also significantly reduced when compared with the pathogenic DOCA group. Renal markers such as serum creatinine and BUN were shifted towards normal on SNEC administration. SNEC also showed good antioxidant properties by increasing the levels of reduced glutathione, catalase & superoxide dismutase and decreasing the level of thiobarbituric acid reactive substances.

Conclusions- The result suggests that nano curcumin has a good cardio protective effect by showing ACE inhibiting activity and marvelous antioxidant properties.

Keywords: Curcumin, nanoemulsion, antihypertensive

Design and Synthesis of α-glucosidase Inhibitors as Promising Anti-diabetic Agents: Current Developments and Future Challenges

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Abstract:

Diabetes mellitus is one of the biggest challenges for the scientific community in the 21st century. It is a well-recognized multifactorial health problem contributes significantly to high mortality rates by causing serious health complications mainly related to cardiovascular diseases, kidney damage and neuropathy. The inhibition of α-glucosidase (enzyme that catalyses starch hydrolysis in the intestine) is an effective therapeutic approach for controlling hyperglycemia associated with type-2 diabetes. However, the presently approved drugs/inhibitors such as acarbose, miglitol and voglibose have several undesirable gastrointestinal side effects impeding their applications. Therefore, we have designed and synthesized novel and more effective inhibitors with reduced side effects and less cost remains a fascinating area of research. In this context, a large variety of α-glucosidase inhibitors have been identified in recent years that demands attention from drug development community. Keeping side effects as the prime priority, a series of heterocyclic derivatives have been developed.

Keywords: Diabetes mellitus, heterocyclic, anti-diabetic, α-glucosidase inhibitors

Method Development and Validation of Simultaneous Estimation of Hydrochlorothiazide and Triamterene in Combined Capsule Dosage Form by RP-HPLC Method

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Abstract:

A new simple, accurate, rapid and precise isocratic high performance liquid chromatographic (HPLC) method was developed and validated for the determination of Hydrochlorothiazide (HTZ), and Triamterene (TMT) in Capsule formulation. The optimized conditions comprises of column Purospher ®STAR C18250 mm x 4.6 mm I.D; 5 µm with a flow rate of 1.0 mL/min, 0.05 M Phosphate buffer, methanol and acetonitrile mixture was used as mobile phase in the ratio 55:35:10 v/v at a detection wavelength 270 nm. Retention times of HTZ and TMT were found to be 3.49 min, and 4.68 min with a tailing factor 1.25, 1.27 and 4704, 4841 as theoretical plates respectively which are within the limits. All the parameters were validated according to the ICH guidelines and found to be within limits. Limit of detection (LOD) and Limit of quantification (LOQ) were estimated from the signal-to-noise ratio. The LOD values of HTZ and TMTwere found to be 0.089 and 0.251 µg/mL respectively. HTZ and TMTLOQ's were found to be 0.27, and 0.78µg/mL respectively. Linearity ranges for HTZ, and TMT were 2-10 µg/mL,and 3-15 µg/mL respectively. Percent recovery study values of HTZ and TMT were found to be within 98-102 %. This new method have successfully developed and validated as per ICH guidelines, can be utilized for the quantitative estimation of HTZ and TMT in pharmaceutical dosage forms.

Keywords: Hydrochlorothiazide, triamterene, RP-HPLC, validation, simultaneous estimation

Phytochemical and Pharmacognostic Study of *Ficus religiosa*

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Abstract:

Ficus religiosa (L.), commonly known as peepal (Moraceae), is used traditionally as antiulcer, antibacterial, antidiabetic, antiasthamatic, in the treatment of gonorrhea and skin diseases. Bark is white or brown in color. The leaves are shiny, thin, and bear 5–7 veins. Fruits are small, about ½ inch in diameter. It is circular in shape and compressed. When it is raw, it is of green color and turns black when ripe. Morphological characters identified by studying Powder characteristics. Result of study shows presence of upper and lower epidermal cells in surface view, anomocytic stomata, palisade and spongy cells, parenchyma and collenchyma cells, reticulate, pitted and spiral vessels, thick walled fibre, crystal fibre, prismatic crystals of calcium oxalate. Physicochemical evaluation including parameters such as water and alcohol soluble extractive value, moisture content, total ash value, acid insoluble ash value and water soluble ash value was carried out .Test for carbohydrates, proteins, amino acid ,steroids, terpenes, alkaloids tannins and phenolic compounds was performed in leaf, bark and fruit .The study shows presence of most of phytochemicals in leaf, bark, and fruits like carbohydrates, proteins, amino acid ,steroids, terpenes, alkaloids tannins. Fats and oil were found absent.

Keywords: *Ficus religiosa*, antiasthamatic, phytochemical

Formulation and Evaluation of Fast Disintegrating Tablets of Caffeine by Using Effervescent Formulation Approach

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Abstract:

These pills dissolve or disperse in the mouth when placed there without the need for any additional water, and the active medicinal contents were quickly released from the dose form. These formulations; acceptance and utility led to the creation of a number of ODT technologies. For small children, the elderly, people who have trouble swallowing, and in circumstances where a drinkable liquid (water) was not accessible, these tablets were practical. With its ability to stimulate the central nervous system, caffeine helps people stay awake longer and think more quickly and clearly. It also helps people concentrate better and have better overall bodily coordination. When dissolved in water, soluble effervescent tablets produce a solution that was readily ingested by patients and briefly prevents sleepiness while regaining awareness. The current study outlines the rapid disintegrating tablet formulation process, evaluation criteria, and potential future applications (FDTs).

Keywords: Caffeine, citric acid, effervescence, fast disintegrating tablets, FDTs, sodium bicarbonate, sorbitol

Acacia catechu Ethanolic Seed Extract Triggers Apoptosis of SCC-25 Cells

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Abstract:

This study evaluated the cytotoxic activity of ethanol extract of A. catechu seed (ACS) against SCC-25 human oral squamous carcinoma cell line. The cytotoxic effect of ACS extract was determined by 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide assay, using concentrations of 0.1–1000 µg/mL for 24 h. The apoptotic marker gene expressions such as caspase 8, 9, Bcl-2, Bax, and cytochrome c were evaluated by semiquantitative reverse transcription-polymerase chain reaction. Morphological changes of ACS treated SCC-25 cells were evaluated by acridine orange/ethidium bromide (AO/EB) dual staining. Nuclear morphology and DNA fragmentation were evaluated by propidium iodide (PI) staining. The results showed that the ethanol seed extracts of *A. catechu* were cytotoxic at lower concentrations and induced apoptosis in human oral squamous carcinoma SCC-25 cells. This treatment caused significant upregulation of apoptotic markers caspases 8 and 9, cytochrome c, and Bax gene expressions, as well as significant downregulation of Bcl-2 gene expression. The study suggests that *A. catechu* seed extract could be a potential therapeutic agent against human oral squamous carcinoma.

Keywords: Apoptosis, caspases, cytotoxicity, oral cancer

Gene Therapy in Cancer

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Abstract:

Gene therapy is a technique that involves altering the genes inside a person's cells to treat or prevent diseases. This can be achieved by introducing new genes into a patient's cells for repairing or modifying existing genes, or suppressing the expression of genes that are causing genetic disorders. Cancer is a complex disease that results from genetic mutations and alterations in the cellular machinery. Gene therapy offers a novel approach to cancer treatment by directly targeting the underlying genetic defects that drive tumorigenesis. Traditional cancer treatments such as chemotherapy and radiation therapy have limitations and can cause harmful side effects. On the other hand, gene therapy is a promising approach that aims to target and modify the genetic material of cancer cells to treat the disease. Critical developments have occurred in gene therapy for targeting cancer cells. Gene therapy is a promising new approach to cancer treatment that involves the manipulation of genes in cancer cells to target and destroy them. Using CRISPR-Cas9 revolutionary technology for research can target and modify DNA sequences and correcting genetic mutations that cause disease. Now on recent studies gene therapy can be used for rare genetic disorders such as spinal atrophy & Leber congenital amaurosis.

Keywords: Gene therapy, cancer, tumor

Role of Polymer Platform Technology in Enhancement of Drug Release Performance of Ritonavir

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Abstract:

Ritonavir is an antiretroviral drug characterized by low solubility and high permeability which corresponds to BCS class II drug. The aim of present work is to study the release of Ritonavir from solid dispersions with binary polymer component PVP and chitosan using microwave assisted physical mixing technique. Material and methods: Different drug-to-polymer ratios were prepared to investigate the appropriate concentration of polymer required to enhance the solubility of the drug and improve its release kinetics. Optimization of solid dispersion of ternary complexation a 3^2 level full factorial design with Design Expert Software version 12 had been used. The physicochemical properties of dispersions were evaluated by using Fourier transform infrared spectroscopy (FTIR), the study of FTIR could not show significant interaction between Ritonavir and the polymers incorporated i.e., PVP and Chitosan. The Polymeric dispersions prepared were evaluated for the release of ritonavir over a period of 1 hour in 0.1N HCl using USP type II dissolution apparatus. The *in vitro* drug release study revealed that the dispersion techniques have increased the dissolution rate. The *in vitro* release profile indicate that release of Ritonavir can be effectively increased from a formulation containing polymeric dispersion of optimum concentration of PVP and chitosan.

Keywords: Ritonavir, antiretroviral, chitosan, microwave assisted physical mixing technique

Suspected Adverse Drug Reactions of COVID-19 Vaccination in Adolescents Based on Severity

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Abstract:

The DCGI has approved three vaccines for restricted use in emergency situation in the India: Covishield by Oxford, Covaxin by Bharat Biotech and Sputnik. In fourth phase, vaccines were made available for adolescents of age 15-18 on January 10, 2022. For pathological point of view, similar reactions might show immunogenic challenge with a corresponding vaccine. Conclusively, Cutaneous Adverse Drug Reactions seem to be frequent events in the course of COVID-19 vaccines, some of the Adverse Drug Reaction are pain at the injection site, fatigue, headache, myalgia, pyrexia, chills, arthralgia, to mild extent. A method of Ambispective study conducted, using Informed Consent Form, ADR Reporting Form. After the data was checked manually for completeness and was entered and analysed by MS Excel software. Out of 120 students, 73.33% experienced mild symptoms, 10.83% experienced moderate symptoms, 0% students experienced severe symptoms and 15.83% did not experienced any symptoms after receiving COVID-19 Vaccine.

Keywords: COVID-19, vaccination, adolescents, adverse drug reactions, ambispective

Assessment of Knowledge and Attitude of Medical and Nursing Students Towards Clinical Pharmacy Services in Southern India

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Abstract:

Clinical pharmacy services are patient-centered services that aim to improve the rational use of medicines by maximizing therapeutic effect, minimizing risk and respecting patient preferences and decisions, ensuring the safe, effective, and cost-beneficial therapy of individual patients. The aim of this study is to assess the knowledge and attitude of medical and nursing students towards clinical pharmacy services in Southern India. A cross sectional study conducted by using self-administered questionnaires to collect the data on knowledge and attitude of medical and nursing students towards clinical pharmacy services. After the data was manually checked for completeness and consistencies, it was entered and analyzed by MS Excel software. Descriptive statistics was used to present the data. Out of the 191 medical and nursing students involved in the study, 158(82.72%) of them were heard about clinical pharmacist in pre-test, 174(91.09%) of them think that clinical pharmacist are integral part of medical team after the awareness. 149(78.01%) of them knew that clinical pharmacist will make the selection of therapy more easier, 154(80.62%) of them think that clinical pharmacy services is desirable in health care system after providing awareness. Majority of them were having adequate knowledge and positive attitude towards clinical pharmacy services and its implementation in the hospital.

Keywords: Clinical pharmacy services, medical students, nursing students, clinical pharmacist

Impact of AI Tools and Systems in Cold Chain Pharmaceutical Supply

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Abstract:

Temperature-sensitive pharmaceutical products are often expensive and can have a short shelf-life. In pharma logistics field cold chain pharmaceutical suppliers play a critical role in the safe and effective distribution of temperature-sensitive pharmaceutical products, such as vaccines, biologics, and other specialty medicines. Here, use of specialized equipment and processes is must to maintain the products within a narrow temperature range, ensuring that they remain safe and effective for patients. Also many temperature-sensitive pharmaceutical products are subject to strict regulatory requirements. Cold chain pharmaceutical suppliers must comply with these regulations to ensure that the products are transported and stored safely and legally. AI can be used to enhance the quality control of pharmaceutical products during transportation and storage, particularly in the context of cold chain logistics. Different AI based tools and systems like Logmore QR data loggers, Zest Labs, FREDsense Technologies etc plays an important role to support compliance, minimise the risk and ensure the patient safety.

Keywords: Pharmaceutical product, shelf-life, temperature-sensitive, AI

In silico Screening of RNA Dependent RNA Polymerase Inhibitors of SARS-CoV-2

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Abstract:

The Coronavirus disease 2019 caused by a new strain of coronavirus COVID 19, also called 2019 novel coronavirus (2019-nCoV) or SARS-CoV-2, is a dangerous respiratory disease caused by a novel coronavirus primarily detected in Wuhan, China in 2019, affect sinuses, nose, throat (upper respiratory tract) windpipe and lungs (lower respiratory tract) of humans, bats, and other animals also. The COVID-19 pandemic resulted in remarkable levels of morbidity and mortality all over the globe. Initially China, followed by the USA, Italy, France, Iran, Spain, Russia, Turkey, and the UK became hotspots for COVID19. Currently, there is no specific treatment to cure COVID-19. Many medicinal plants have antiviral, antioxidant, antibacterial, antifungal, anticancer, wound healing etc. Therefore, the aim of the current study was to screen for potent inhibitors of RNA dependent RNA polymerase of SARS-CoV-2 which plays an essential role in replication and transcription novel corona virus genome. *In-silico* studies done using molecular dynamics simulation, molecular docking and ADMET methodology. The structure of RNA dependent RNA polymerase of SARS coronavirus 2 was retrieved from the Protein Data Bank (PDB 7BV2) and the structures of 100 phytocompounds were retrieved from Pubchem. ADME of phytocompounds done using Qik pro tool of schrodinger, Molecular docking was done by using the Schrodinger's maestro 12.0 and molecular dynamics of compound with highest glide score (-9.124) Baicalin and reference compound Remdesivir done using Sbybl software. From the Docking Study, it was observed that ligands bind to the H bond, metal coordination and salt bridge with A POP 1003, A MG 1004, A MG 1005 formed by the residues which play an essential role for RNA dependent RNA polymerase inhibition. Out of 103 results obtained after docking, 23 compounds gave better glide scores than Remdesivir and 11 compounds gave lesser but comparable glide scores as Remdesivir. Baicalin gave the following interactions H bond (1.83,1.84 Å) with POP 1003, metal coordination bond (2.15, 2.14 Å) and salt bridge (2.14 Å) with a MG 1004, metal coordination bond (2.06 Å) and salt bridge (4.30 Å) with a MG 1005. From MD simulation data, we found that complexes of 7BV2 with Baicalin were stable up to 100 ns, indicates that stability in the set of standard deviation values of all potential energy, kinetic energy and total energy is more in case of Baicalin than reference remdesivir This phytocompound can be tested further for *in vitro* or *in vivo* and used as a potential drug to cure SARS-CoV-2 infection.

Keywords: Maestro, chemdraw, RNA dependent RNA polymerase protein, SARS-CoV-2, COVID-19, glide score, molecular docking, 7BV2, molecular dynamics, baicalin, remdesivir

Development and Evaluation of Sitagliptin Loaded Nano-gel for its Anti-Diabetic Efficacy Through Transdermal Route

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Abstract:

Sitagliptin is an anti-diabetic drug that is used to treat type 2 diabetes mellitus. The drug is administered orally, and its efficacy is limited due to poor bioavailability and rapid elimination from the body. In this study we developed a sitagliptin loaded nano gel for transdermal delivery to improve the drug's efficacy of the nano gel formulation.

Methods: The sitagliptin loaded nano gel was prepared using a solvent diffusion method and characterized for particle size, zeta potential, drug loading and encapsulation efficiency. *Ex-Vivo* skin permeation studies were determined using a Franz diffusion cell.

Benefits: Better safety, Improved efficacy, Increased Patient compliance.

Conclusion: The sitagliptin loaded nano gel showed promising results for the transdermal delivery of sitagliptin. The nano gel formulation exhibited sustained release of the drug and significantly improved anti-diabetic efficacy compared to oral administration of the drug. The sitagliptin loaded nano gel having a potential to be an alternative to oral administration for the treatment of type 2 diabetes.

Keywords: Sitagliptin, nanogel, antidiabetic, transdermal

Pharmacological Investigation of Herbal Extracts for Nootropic Effect

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Abstract:

Dementia is a group of symptoms that develop in the brain and is linked to a decline in reasoning, orientation, language, memory, and judgement. A recent report from the Alzheimer's and Related Disorders Society of India estimates that over 3.7 million people in India already suffer from dementia, and that number is likely to quadruple by 2030. Numerous medicinal herbs have been asserted to have learning and memory-improving properties through a variety of processes, including AChE inhibition, antioxidant action, activation of neurotrophic factors, and cell death mechanisms. Although pre-clinical research revealed some intriguing dementia options, clinical data still has to be investigated. This review is a valuable resource for quick information regarding plants with known nootropic activity. This review is a helpful resource for quick information regarding plants with known nootropic effects. For thousands of years, people in China have utilised *Gardenia jasminoides*, also known as Zhizi, as a nutritional supplement and traditional medicine. Recent research on *G. jasminoides* has shown that the extracts or active components are crucial for oxidative stress, inflammation, hepatoprotection, neuroprotection, anti-diabetes, and other processes. In this article, we studied *G. jasminoides* in terms of its clinical use, chemical components, pharmacology and pharmacokinetics, safety and toxicity assessment, and botanical identity. The crude extracts and steroids have been shown to exhibit a variety of *in vitro* and *in vivo* pharmacological properties, including the ability to reverse multidrug resistance and have anticancer, anti-angiogenic, immunomodulating, and anti-HIV effects.

Keywords: Anticancer activity, anti-antigenic activity, anti-diabetic activity, antioxidant activity, neurotrophic activity

Design, Synthesis and Evaluation of CNS depressant activity of 2-(4-phenylpiperazin-1-yl)-1h-benzo[d]imidazole and 2-(4-phenylpiperazin-1-methyl)-1h-benzo[d]imidazole derivatives

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Abstract:

In present study organic synthesis of CNS depressant Benzimidazole derivatives is done conventionally. The benzimidazole nuclei are condensed with various piperazine substituents in organic solvent and their CNS depressant activity is determined using Elevated Plus Maze test and Hole Board test. Initially the designed derivatives were screened for pharmacological activity and pharmacokinetic properties through PASS online study and Molinspiration study respectively. Among all derivatives 5(II), 5(III) and 5(VI) has shown excellent anxiolytic activity.

Keywords: Benzimidazole, piperazines, synthesis, Mass & NMR, Hole Board Test, Elevated Plus Maze Test

Biomaterial-A Key for Preparing Green and Sustainable Products

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Abstract:

Green chemistry is a modified, ecologically friendly way of thinking and creating. It includes, the creation and use of less harmful materials for the environment. The field of "Green Chemistry" is the combination of tools, techniques, and technologies that enables chemists all over the world to create products and processes that are more efficient and environmentally friendly. A methodology for chemical research and engineering called "Green Chemistry" promotes the creation of products and processes that resemble the usage and production of dangerous compounds. Any chemical decision should be made with an eye towards minimising risk and increasing effectiveness. It is a triple "R" process—reduces, reuses, and recycles—that is reversible. Green chemistry is the practise of conducting chemical reactions using renewable, biodegradable materials that do not harm the environment. These organic resources, biological materials, and biological catalysts are useful for increasing productivity, carrying out chemical processes at room temperature, and reducing unhealthy habits in human behaviour. Governments and business are collaborating with "Green" chemists to change the economy worldwide and make it more sustainable.

Keywords: Green chemistry, biomaterial, biocatalyst

Artificial Intelligence Technology: The necessity for Regulatory Framework, Challenges and Limitation

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Abstract:

Artificial intelligence is the simulation of human intelligence processes by machines, especially computer system. At its simplest form, artificial intelligence is a field, which combines computer science and robust datasets, to enable problem-solving. To understand some of the deeper concept, such as data mining, natural language processing, and driving software, we need to know the three basic AI concepts: machine learning, deep learning, and neural network. The regulatory proposal aims to provide AI developers, deployers and users with clear requirements and obligations regarding specific uses of AI. A number of substantive and procedural gaps were identified, which show that there is a need for a more comprehensive governance framework and an effective international legal response and AI systems pose limited to no risk and can contribute to solving many societal challenges, certain AI systems create risks that we must address to avoid undesirable outcomes. Thoughtful regulation can promote reliable, robust, and trustworthy AI applications. Therefore, regulatory reviews should focus on AI-enabled applications and the quality of their specific results.

Keywords: Artificial intelligence, computer science, machine learning, deep learning, neural network

Method Development and Validation of Bio-analytical Method for the Estimation of "4-oxo tretinoin" in Human K3EDTA Plasma Using LC-MS/MS

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Abstract:

Bio-analytical method development and validation represents the safe, efficient and assured drug determination in the biological matrix. This elucidates the technique that will allow method to extract, qualify, quantify and interpret the bioavailability, bioequivalence of analyte of interest and their metabolites. The development of this Vitamin A derivative, 4-oxo tretinoin, was performed using charcoal stripped human K3EDTA plasma by ultra-high performance liquid chromatography (UPLC-MS/MS), on Zorbax SB-C8 column (150mm,4.6mm, 5µm) with 4-oxo tretinoin D3 as internal standard. The mobile phase comprises of 30mM Ammonium acetate buffer: acetonitrile (8:92 v/v) with a flow rate of 0.600 ml/min at temperature 35°C. The m/z ratio of analyte Q1 scan is 313.2/254.2 and Q3 scan is 316.3/257.2 by Triple Quad 6500 spectrometer. Validation is the crucial step where accuracy, precision, Limit of Detection (LOD), Limit of Quantification (LOQ), ULOQ found to be 5.02% and stability studies as bench top stability, autosampler stability, freeze thaw stability were estimated. Thus, the method was developed and this bio-analysis plays important role in assessment and interpretation of pharmacokinetic, toxicokinetic and bioequivalence studies.

Keywords: Charcoal stripped plasma, 4-Oxo Tretinoin, LC-MS/MS

Test of Significance- When to use a t-test in Research?

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Abstract:

The simplest experimental design is to have two conditions: an "experimental" condition in which subjects receives some kind of treatment, and a "control" condition in which they do not. We want to compare performance in the two conditions. Sometimes, the difference between the two conditions is very clear-cut: our experimental treatment has made a clear difference to subjects & behaviour. More often in psychology, the difference between the conditions is not so obvious; in these circumstances, use of a t-test can help us to decide whether the difference between the conditions is "real" or whether it is due merely to chance fluctuations from one time of testing to another. The t-test enables us to decide whether the mean of one condition is really different from the mean of another condition. There are two versions of the t-test: (a) dependent-means t-test (also known as the "matched pairs" or "repeated measures" t- test): use this when the same subjects participate in both conditions of the experiment. (b) independent-means t-test (also known as an "independent measures" t-test): use this when you have two different groups of subjects, one group performing one condition in the experiment, and the other group performing the other condition. In both cases, we have one independent variable (the thing we manipulate in our experiment), with two levels (the two different conditions of our experiment). We have one dependent variable (the thing we actually measure).

Keywords: t-test, research, control

Preparation and Optimization of Microwave-assisted Ball-milled Olmesartan Medoxomil with Chitosan using Full 3^2 Factorial Design

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Abstract:

This study aimed to enhance the solubility and stability of the antihypertensive drug olmesartan medoxomil (OLM) by modifying its crystalline form, thereby reducing dosage and economic burden for the pharmaceutical industry. A full 3-level 2-factorial design was employed to prepare an OLM formulation using chitosan and neusiline as independent factors. Microwave-assisted ball milling technology was employed to prepare the formulations. The results of the phase solubility study demonstrated that the saturation solubility of the ternary mixture was approximately 12 times higher than that of the pure drug. Various analyses, including FTIR, DSC, SEM, and NMR, confirmed the physical interaction between the polymer and OLM. XRD analysis verified the alteration of the drug & crystalline form, which could have implications for its solubility and dissolution rate. The optimized batch obtained from the factorial design was subjected to electrically operated ball milling, resulting in significant improvements in solubility, stability, and dissolution rate. In conclusion, the utilization of chitosan in conjunction with microwave-assisted ball milling represents a promising approach to enhance the bioavailability of BCS II drugs. This novel breakthrough has the potential to benefit the pharmaceutical industry by improving the formulation.

Keywords: Microwave-assisted milling technology, chitosan, olmesartan, neusiline, factorial design

Comparative Evaluation of Paediatric Drug Regulation in INDIA, EU and USA

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Abstract:

The pediatric regulations are comparatively new and emerging globally with the identical objective of improving children's health. In the past practices before paediatric regulations were established for paediatric drugs, the children were treated by drugs based on adult studies with limited or subjective paediatric experience. This is called off-label use of the drug. Over the years, this view has changed to promote thoughtful drug development for children by including them in the trials when anticipating the drug's, the paediatric use. Several guidelines and legislation emerged in this direction, e.g., ICH E11, to provide a harmonised approach for clinical investigation of medicinal products in the paediatric population. ICH S11 focuses on providing a harmonised approach for non-clinical safety testing during paediatric drug development. US FDA and EMA have made it mandatory to comply with laws, i.e., PREA and EU regulation (Regulation (EC) 1901/2006) respectively. The regulatory agencies have differences in the legislation; however, the end goal is similar that the children should have access to medicines that have been appropriately assessed for use in the intended population. The drug's safety and efficacy may vary between paediatric vs adult populations, and within different paediatric age groups. The FDA in the united state has a complete set of Pediatrics rules. The department for Pediatrics medication regulation known as Pediatrics therapeutics offices. The FDA modernization act in USA was passed in (1997) Pediatrics population clinical trials. In INDIA, there is presently no specific rule for pediatric clinical trial in India however some provisions are included in schedule Y For the safety of children. In EU pediatric regulation was adopted in January (2007). In EUROPE EMA has various directive and pediatric investigation plans (PIPs). the regulation aims to ensure that medicines for use in children are of high quality.

Keywords: Paediatric, clinical trial, pediatrics, children, pediatric drug development, pediatric legislation, health authorities, regulatory guidelines, PIP (pediatric investigation plan)

Alpha Glucosidase Inhibitors: A Promising Approach to Treat Diabetes

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Abstract:

According to report of International Diabetes Federation (IDF) 2019, Diabetes was the 9th main cause of deaths with an estimated 1.5 million deaths directly caused by diabetes. According to International Diabetes Federation (IDF) 2019 report, top three countries who had highest number of individuals are China (116.4 million), India (77 million) and the U.S.A. (31 million). In the 20th century, Diabetes has became more dangerous disease carbohydrate rich diet countries like Asian countries. In Asian countries, it is important to prevent or cure diabetes even though the high percentage of carbohydrate in diet. So for fortify this requirement, it is necessary to delay the absorption of monosaccharide (glucose) in the blood. Alpha Glucosidase inhibition I the main strategy which delay the absorption of carbohydrate in the blood by inhibiting that enzyme which is necessary for the metabolism of disaccharide in to monosaccharide. So it is very necessary to treat Diabeties for the welfare of the society. Acarbose and Miglitol are some important examples of drugs which are present in market. These drugs successfully delay in increasing the postprandial blood sugar level. Many other chemical moieties are also show promising alpha glucosidase inhibitory activity. In the presentation, we will study about some important chemical moiety, which showed the potential alpha glucosidase activity.

Keywords: Diabetes, alpha glucosidase, postprandial blood sugar level

Designing of Modified Release Tablet Dosage Form of Sparingly Soluble Drug by the Application of Solid Dispersion & Polymer Matric Sintering Technology

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Abstract:

Solubility or Dissolution rate of drug plays a vital role in absorption of the drug from the dosage form and hence its bioavailability. When a drug is administered orally in solid modified release dosage form, it is designed to undergo series of predetermine stages. The slowest or rate limiting step is fond to be dissolution or diffusion of drug at the absorption site. The fact that more than 70% of newly discovered drugs have little or no water solubility presents a serious challenge to the successful development and commercialization of new drug in the pharmaceutical industries. Through numerous techniques of diverse nature such as size reduction, complexation, reduction of hydrophobicity, slat formation, adsorption and solid dispersion have been developed for the enhancement of dissolution rate but with limited success due to its self-limitation of individual techniques like handling and stability of API's, or poor scaleup for the manufacturing.

A novel modified release tablet has been conceptualized for overcoming of aforementioned limitation of solubility enhancement techniques by simultaneously exploitation of solubility enhancement and polymer matrix sintering techniques. Solubility enhancement technique like Micronization & Solid dispersions of drugs in carriers, of poor compressibility, can be easily formed into a modified release tablets of any suitable shape/size by using a known Polymer Matrix Sintering Technology. Sintering Technology is defined as the bonding of adjacent particle surfaces in a mass of powder, or in compact, by the application of heat. Conventional sintering technique involves the heating of compact at a temperature below the melting point of the solid constituents in a controlled environment under atmospheric pressure. Developed tablets will not only be sustained release characteristics owing to Sintering aspect, but also ensure enhanced solubility of poorly soluble drug because of Micronization or solid dispersion.

Keywords: Solid dispersion, solubility, sustained release, modified release, tablet

Virtual Screening Based on Pharmacophore and ADME Prediction for Identification of Designated SARS-CoV-2 Inhibitors from Antiviral Libraries

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Abstract:

Identification and development of innovative promising chemicals have benefited greatly from integration of computational and experimental methodologies. Methods like molecular docking, which are widely utilised in current drug development, investigate the ligand conformations that can attach to macromolecular targets. By analysing crucial phenomenon involved in the intermolecular recognition process, this technique also estimates the ligand-receptor binding free energy. Today, with so many docking algorithms to choose from, it's critical to know the benefits and drawbacks of each to design successful tactics and provide useful outcomes.

Keywords: Virtual screening, pharmacophore, ADME, SARS-CoV-2, antiviral

A Review: Biophysics and Cell Function

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Abstract:

Cellular biophysics is a branch of biophysics in which we study cells from the perspectives of the physical chemist or physicist by utilizing the physical techniques, mainly to determine the cell structure, function and their developing models by utilizing their physical-chemical and physics principles. It should have the ability to observe atomic level structure and biological molecules dynamics in their physiological atmosphere, i.e. *in vivo*. It allows the structures visualization that form during chemical reactions or conformational changes, irrespective of time scale.

For numerous reasons, biological cells and tissues electrical characteristics was examined from a very long time. It governs bodies current flow patterns, making them crucial for biological uses like as functional electrical stimulation, weak electric current diagnostics and therapy, electrocardiography, radio frequency hyperthermia and body composition. These electrical qualities help explain essential biological activities. Certainly, biological impedance investigations shows that it is significant in biophysics and electrophysiology; dielectric tests on cell suspensions proved the presence of the cell membrane. To study response of tissue towards the electric stimulation, it is needed to determine the tissue conductivities and relative permittivity. The microscopic depiction of response is got difficult due to diversity in shapes of cells and their location throughout tissue and also the characteristics of extracellular media.

Keywords: Biophysics, extracellular, electric current, physicist

Chronopharmaceutics: A Biological Clock Dependent Drug Delivery

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Abstract:

Chronopharmaceutics is a branch of pharmaceutics, which deals the design of pharmaceutical preparation liberate the bioactive agent to the body that ideally matches the desire requirement of given disease therapy according to biological rhythms i.e. circadian rhythms. The effect and toxicity of many drugs are depending on the relationship between the dose routine and circadian rhythm. The circadian rhythms, the meaning of these words' Circadian means approximately day and rhythm means biological behaviors. This rhythm found in Animals that synchronizes with presence and absence of light (solar light). The circadian rhythm depends on biological clock as well as circadian clock, that reminds us what to do at what time. It synchronizes your body at day and night with different function. Circadian clock is a molecular mechanism that lies within our hypothalamus present in our brain, called suprachiasmatic nuclei (SCN). SCN receive input from optic nerve connected to an eye and it turn and finally the SCN will give that output in the form of hormone via endocrine system and influences a biological process, including the sleep- wake rhythm. Thus, knowledge of the 24hrs rhythm in the risk of disease plus confirmation 24hrs rhythm dependencies of drug pharmacokinetics, effects and safety. The best approaches of effectiveness of pharmacotherapy in the administration of drugs at time by which they are most effective & tolerated. The mechanisms underlying chronopharmacological findings should be clarified from the viewpoint of clock genes, are the genes that control the circadian rhythms in physiology and behavior. The interaction between circadian clock and a drug knowledge should be very useful in clinical experiment. Therefore, the object of this review is to provide an outline of the time dependent dosing alteration in therapeutic result and welfare of drugs.

Keywords: Chronopharmaceutics, circadian rhythm, suprachiasmatic nuclei, clock genes

Comparative Study and Qualitative Phytochemical Screening of Different Extracts of *Madhuca Longifolia* Leaf and Flower to be Used as Antilithiatic Activity

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Abstract:

This Research is a comparative analysis of several extracts of *Madhuca longifolia* leaf and flower, as well as a comparison of phytochemical screening among all extracts (Aqueous & Methanolic Extracts of *Madhuca longifolia* leaf and flower). Fresh leaves of *Madhuca longifolia* and flower were collected and shade dried for 07 days, and dried leaves were subjected to size reduction and passed through sieve no.40 and dried flower to be size reduced. Aqueous and Methanolic extract was prepared by the Soxhlet apparatus for both leaf & flower. The presence of phytoconstituents was found to be more in Methanolic extract of *Madhuca* leaf as comparison to Methanolic *Madhuca* flower extract, while aqueous extracts of *Madhuca longifolia* leaf and flower shows less as compared to Methanolic extracts. The percentage yield of Methanolic extract was much better as compared to aqueous extracts. The results of the qualitative phytochemical analysis showed that the leaf's methanolic extract contains several secondary plant compounds with significant therapeutic efficacy, which have the Antilithiatic property.

Keywords: *Madhuca longifolia*, phytoconstituents, methanolic extract, aqueous extract

Nutraceuticals: A New Approach for the Antimicrobial Resistance

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Abstract:

Nutraceutical is defined as a food or part of it that provides the body with medical or health benefits, including the prevention and treatment of a disease. It is seen as a more natural way to accomplish therapeutic results with minimal side effects, and this view has propelled the discovery and production of nutraceuticals to become a multibillion-dollar enterprise. Nutraceuticals are categorized as commercial additives obtained from natural products as alternative feed supplements for the improvement of animal welfare. It is known that diet, whether in the short or long term, is a major modifier of microbiota composition and function. Of the various nutraceuticals, two categories, prebiotics and probiotics, have received the greatest attention in basic research and product development. Pharmaceutical interest in the human intestinal microbiota has increased considerably, because of the increasing number of studies linking the human intestinal microbial ecology to an increasing number of non-communicable diseases. Many efforts at modulating the gut microbiota have been made using probiotics, prebiotics and recently postbiotics.

Keywords: Nutraceutical, prebiotic, postbiotic, antimicrobial, resistance

Hepatoprotective Activity of *Berberis Aristata* Against Cyclophosphamide (Cp) Induced Hepatotoxicity

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Abstract:

The whole plant of *Berberis aristata* belongs to family Berberidaceae (Indian name: Barberry). It is an evergreen shrub growing in himalayan region and used in variety of diseases including throughout the world.

Objective: The aim of this study was to find out the hepatoprotective activity of *Berberis aristata* against Cyclophosphamide (CP) induced hepatotoxicity.

Materials and methods: Fifty four Wistar albino rats were divided into nine groups. First group received normal saline; second group received CP (20 mg/kg/day) i.p for seven days; third group received CP (20 mg/kg/day) i.p. for seven days and the Silymarin (50 mg/kg/day) orally for ten days; fourth group received Pet Ether extract of *Berberis aristata* (100 mg/kg/day) orally for 21 days with CP (20 mg/kg/day) i.p for seven days; fifth group received CP (20 mg/kg/day) i.p for seven days and Pet Ether extract of *Berberis aristata* (500 mg/kg/day) orally for 21 days; sixth group received Ethyl Acetate extract of *Berberis aristata* (100 mg/kg/day) orally for 21 days with CP (20 mg/kg/day) i.p for seven days; seventh group received CP (20 mg/kg/day) i.p for seven days and Ethyl Acetate extract of *Berberis aristata* (500 mg/kg/day) orally for 21 days; eighth group received CP (20 mg/kg/day) i.p. for seven days with Aqueous extract of *Berberis aristata* (100 mg/kg/day) orally for 21 days; ninth group received CP (20 mg/kg/day) i.p for ten days and then Aqueous extract of *Berberis aristata* (100 mg/kg/day) orally for 21 days**.**

Results: The hepatotoxic effect of CP is due to generation of ROS. It is well known that generation of ROS produces the changes in cell redox balance and leads to oxidative stress. The hepatotoxicity was evidenced by high lipid peroxidation (MDA level), GSH depletion, and reduction in body weight as well as histological changes. The study indicate that *Berberis aristata* (Ethyl Acetate as well as Aqueous extract) were showed more appreciably improvement on the liver as compare to treatment with Pet Ether extract (100 as well as 500 mg/kg/day) when these treatment were given with CP induced toxicity.

Conclusion: The results of this study revealed that *Berberis aristata* have free radical scavenging potency against increased production of reactive oxygen species by CP and act as potent hepatoprotective agent.

Keywords: Hepatoprotective, *Berberis Aristata*, cyclophosphamide, hepatotoxicity

Unilateral Adrenalectomy as Potential Stress Model in Rats

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Abstract:

The adrenal gland is a small, triangular-shaped endocrine gland located on top of the kidneys, consisting of two main parts: the adrenal cortex and the adrenal medulla. The adrenal cortex produces various hormones, including cortisol, aldosterone, and androgens, which play critical roles in regulating metabolism, blood pressure, electrolyte balance, and sexual function. The adrenal medulla secretes epinephrine and norepinephrine, which are involved in the body's response to stress. The adrenal gland plays a crucial role in the body's response to stress. In response to stress, the adrenal gland releases cortisol and other hormones that prepare the body to deal with the stressor. However, chronic stress can cause the adrenal gland to become overactive, leading to conditions such as Cushing's syndrome.

Adrenalectomy, or surgical removal of one or both adrenal glands, is used to treat a variety of conditions, including adrenal tumours, Cushing's syndrome, and Conn's syndrome. Unilateral adrenalectomy, or removal of one adrenal gland, can lead to a reduction in adrenal hormones, potentially causing adrenal insufficiency and stress. Thus, Unilateral Adrenalectomy may serve as an induction model of stress in rats. However, more further studies are required to establish this model.

Keywords: Unilateral, adrenalectomy, potential, stress model, rats

Psychosis in Alzheimer's Disease : Mechanisms, Genetics and Treatment Options

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Abstract:

Alzheimer's patients frequently experience the uncomfortable symptom of psychosis, and there aren't many safe and efficient treatments for it. New methods for diagnosing and treating symptoms, however, are starting to advance the area. The rise of psychotic symptoms in elderly persons has opened up new nosological viewpoints even in advance of dementia into epidemiological and neurobiological frameworks as well as into diagnostic and research criteria such as the International Psychogeriatric Association criteria for psychosis in neurocognitive disorders, the Alzheimer's Association International Society to Advance Alzheimer's Research and Treatment (ISTAART) research criteria for psychosis in neurodegenerative disease, and the ISTAART criteria for mild behavioural impairment. Here, we present the most recent research in neurobiology, neuroimaging, and genetics that is influencing methods for drug development and repurposing. With an emphasis on safety and precision medicine, current pharmacological and non-pharmacological therapeutic alternatives are explored. We also look at pimavanserin trial results, a new drug with potential for treating dementia-related psychosis and discuss presently available medications including escitalopram, lithium, cholinesterase inhibitors, and vitamin D that may be helpful but still require additional study. Though it is still difficult to identify and treat psychosis in persons with dementia, new prospects are giving the field direction and optimism.

Keywords: Alzheimer's, psychosis, genetics, treatment

Pharmacovigilance: Current Scenario of ADR Reporting in Rural India

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Abstract:

India, a big land mass with enormous number of people contributes more than 17% of world's population. Approximately 69% of this 17% reside in the rural areas. We have more than 6000 licenses issued for drug manufacturing that produce and dump more than 60,000 branded formulations in the Indian market for sale. India stands at fourth position in medicine production and also a centre for clinical trials. Many new promising molecules are entering drug market as requirement is at rise due to increasing disease and ailments list. It also becomes important to have a well established system to handle the possible ADR reports of the newcomer molecules. ADR reporting from India is only 1% as compared to world's 5%. Pharmacovigilance process only runs due to successful ADR reporting. Its base is data provided from various sources. Local findings reveal that near about 24% of the morbidity occurs due to adverse drug reactions from which more than 3% turns out to be fatal. Inadequate reporting and lack of established system with scarcity of medical professionals in remote rural places plays a vital role in happening of avoidable ADRs which are also under reported or not reported at all. Exposure to such drug calamities also brings forth drug resistance, drug tolerance as well as addiction. Rural population where literacy rate is dwindling condition is at more risk. Multiple drug therapy practice is commonly found in rural practitioners which always lead to some or the other related consequence. Incorporation of better reporting systems, digitalization of the reporting will make it more accessible and ready to be reported. Introduction of the reporting agencies and recruitment of well qualified and trained staff may lead to its betterment. Challenges will always be the part of the systems but presence is always better than the complete absence.

Keywords: ADR, pharmacovigilance, rural, India, license

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