Pharma Summit 2022 :
Drug Discovery & Community Trial
27th & 28th August 2022

Pharma Summit 2022: Drug Discovery & Community Trial

"Drug Discovery: The Challenges in Development of Drugs and Effects of Drug in Community Trial"

Virtual Conference & Expo

27th & 28th August, 2022

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Preface

This book reports the Proceedings of the **"Pharma Summit 2022: Drug Discovery & Community Trial"** held on **August 27th and 28th 2022**, organized by **Association of Pharmaceutical Research (APR)**.

The publishing department has received more than 140 abstracts. After an initial review of the submitted abstracts, 113 papers were presented at the conference and were accepted for publication in the Conference Proceedings. The topics that are covered in the conference include pharmaceutical technology, Pharmaceutical business management, Novel drug delivery system, Regulatory Affairs and Intellectual Property Rights, Pharmacology and Toxicology, Clinical pharmacy and Hospital Administration, pharmacogenomics, Pharmaceutical Research And Development, Pharmaceutical Engineering and Artificial intelligence, Nanotechnology in pharmaceutics and Drug delivery system, Industrial Pharmacy, etc... We would like to thank all the participants for their contributions to the conference and the proceedings.

Reviewing papers of the **Pharma Summit 2022** was a challenging process that relies on the good will of those people involved in the field. We invited more than 10 researchers from related fields to review papers for the presentation and the publication in the **Pharma Summit 2022** proceeding. We would like to thank all the reviewers for their time and effort in reviewing the documents.

Finally, we would like to thank all the proceeding team members who with much dedication have given their constant support and priceless time to bring out the proceedings in a grand and successful manner. I am sure this **Pharma Summit 2022** will be a credit to a large group of people, and each one of us should be proud of its successful outcome…

Pharma Summit 2022

“Drug Discovery: The Challenges in Development of Drugs and Effects of Drug in Community Trial”

From BioLEAGUES Director's Desk

A. Siddth Kumar Chhajer
Managing Director
BioLEAGUES Worldwide

On behalf of **BioLEAGUES Worldwide**, I am delighted to welcome all the delegates and participants around the globe to the **"Pharma Summit 2022: Drug Discovery & Community Trial"** which is going to be held on **August 27th and 28th 2022.**

This conference will revolve around the theme ***"Drug Discovery: The Challenges in Development of Drugs and Effects of Drugs in Community Trial".***

It will be a great pleasure to join with Doctorates, Research Scholars, and Academicians all around the globe. You are invited to be stimulated and enriched by the latest innovations in all the aspects of Pharmaceutical Science, while delving into presentations surrounding transformative advances provided by a variety of disciplines.

I congratulate the Chairperson, Organizing Secretary, Committee Members, coordinator **BioLEAGUES** and all the people involved for their efforts in organizing the **Pharma Summit 2022** and successfully conducting the International Conference and wish all the delegates and participants a very pleasant conference

A. Siddth Kumar Chhajer

From BioLEAGUES CEO's Desk

Rudra Bhanu Satpathy
CEO
BioLEAGUES Worldwide

It is indeed a privilege to acknowledge and thank all the supporters and organizers of the ***"Pharma Summit 2022: Drug Discovery & Community Trial"***, who contributed greatly to organize the conference successfully.
I would like to acknowledge and thank the conference dignitaries for his/her valuable contribution in the ***"Pharma Summit 2022: Drug Discovery and Community Trial".***

My special thanks to all our eminent keynote speakers who so graciously accepted our invitation to participate in the conference. I also wish to acknowledge and thank the Organizing Committee members for the support.

I would like to specially thank our Advisory Committee Members from various Organization whose continuous support have helped us plan and execute the conference successfully.

I am highly indebted to the contribution given by all the Scientists, Doctorates, Research Scholars, Academicians, and students to the conference.

Rudra Bhanu Satpathy

Pharma Summit 2022: Drug Discovery & Community Trial

Drug Discovery: The Challenges in Development of Drugs and Effects of Drug in Community Trial

Virtual Conference | 27th - 28th August, 2022

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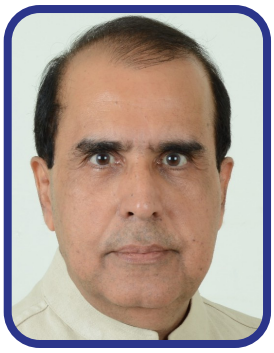

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APR ASSOCIATION OF PHARMACEUTICAL RESEARCH
Pharma Summit 2022:
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Development and Characterization of Niosomal Gel for Topical Delivery of Dithranol

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Abstract
The main aim of the present research was to develop and characterize the antipsoriatic activity of dithranol loaded niosomal gel and to enhance the bioavailability of encapsulated drugs and provide therapeutic activity in a sustained manner for a prolonged period of time. The niosomal delivery of dithranol in carbopol gel base acts as a suitable topical drug delivery system. Dithranol or Anthralin is a hydroxyanthrone, anthracene derivative used for treating thick plaques of psoriasis. Compatibility studies between drug and excipients were confirmed by FTIR spectroscopy and Differential Scanning Calorimetry (DSC). Dithranol loaded niosomes were prepared by thin-film hydration technique. Various evaluation tests carried out for niosomes and niosomal gel. Response surface methodology and central composite design were used for designing of the experiment, to study the interaction between independent variables and dependent variables and deriving optimum formulation. The amount of Cholesterol (X1) and Span 60 (X2) were selected as independent variables while selected dependent variables are Entrapment efficiency (Y1) and % Drug release (Y2). The counterplot, 3D response surface graph, normal probability, and perturbation clearly indicate the interaction of independent variables. The results of entrapment efficiency and in-vitro drug release of niosomes indicate that as the concentration of cholesterol and span 60 increases with also an increase in the entrapment efficiency of niosomes and a decrease in the % drug release of niosomes. After numerical and graphical optimization batch F3 was selected as the optimized batch was used with desirability 0.957. The optimized F3 batch of the niosomal suspension was incorporated into the carbopol gel base and characterization of comparative study between optimized batch (F3) of niosomal gel and marketed plain gel. From the result shows the slow and sustained release of drug through the prolonged period of time was obtained in case of comparative study between niosomal gel and marketed plain gel after 12 hrs. Accelerated stability study of optimized batch shows no significant changes.

Keywords
Dithranol, Niosomes, Response surface methodology, Central composite design, Optimization, Niosomal gel, Accelerated stability study.

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Suitable Polymeric Candidates for Pulmonary

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Abstract
Pulmonary drug delivery system is an effective way to deliver the drugs locally to the lungs in a controlled manner. Numerous natural and synthetic polymers having highly biocompatible and biodegradable characteristics like Polylactic-co-glycolic Acid (PLGA), Poly-ε-Caprolactone (PCL), albumin, chitosan and Poly-Lactic Acid (PLA) have been extensively used in various inhalable formulations for the delivery of drugs, vaccines, protein and peptides to the lungs. Polymers are used to modify the release rate of a drug in the pulmonary tract. FDA-approved polymeric PLA/PLGA particles with excellent structural integrity provide improved stability, increased drug loading, and extended drug release. PCL is a biodegradable, biocompatible and semicrystalline polymer with a very low glass transition temperature. The slow degradation of PCL makes it suitable for extended drug delivery system providing long term delivery of drug. Among the natural polymers chitosan is a natural cationic polysaccharide which can interact strongly with the negatively charged mucosa membranes use as polymer of choice for the pulmonary drug delivery system. Albumin is relatively an inexpensive natural polymer with non-toxicity and high drug loading efficiency use in inhalable formulation. Our study presents the potential and characteristics of various polymers for the development of efficient drug delivery to lungs.

Keywords
Characteristics of polymers, Natural polymers, Pulmonary drug delivery, Synthetic polymers.

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Formulation and Evaluation of Vaginal Drug Delivery System of Tenofovir Disoproxil Fumarate

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Abstract
The present research is aimed to develop a novel pre-exposure prophylactic bioadhesive microparticulate system for vaginal drug delivery of Tenofovir Disoproxil Fumarate (TDF) to overcome the limitations of the conventional dosage forms. Emulsification-internal gelation technique was used to prepare TDF loaded bioadhesive microparticles using sodium alginate and hydroxypropyl methyl cellulose K-100 as polymers at varying drug: polymer ratios of 1:2, 1:4 and 1:9 (EH-1 to EH-6). Scanning electron microscopy of microparticles revealed that they are spherical in shape and particle size decreases with increase in drug: polymer ratio. The entrapment efficiency of TDF in microparticles (EH-4) was found to be 62.09 ± 1.34%. FTIR results ruled out the possibilities of any chemical interaction between the drug and polymers used. DSC and XRD studies indicated that the drug existed in amorphous state in the bioadhesive polymers. Ex vivo bioadhesion studies performed on rabbit vagina showed good bioadhesion. In vitro drug release of the microparticles (EH-4) in simulated vaginal fluid was found to be in a controlled manner and displayed 93.65 ± 5.87 % to 99.19 ± 1.80 % drug release by the end of 8 hours. Thus, the formulated bioadhesive microparticles can be a promising alternative to conventional route of delivery.

Keywords
Bioadhesion, microparticles, sodium alginate, HPMC K-100, tenofovir, controlled release

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Formulation and Evaluation of Gastro Retentive Effervescent matrix Tablets of Metoprolol Succinate

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Abstract

Gastro Retentive Drug Delivery Systems (GRDDS) are the most suitable and advantageous dosage forms among the oral controlled release drug delivery systems which can increase the bioavailability of drugs that show maximum absorption in stomach by prolonging the gastric residence time. Metoprolol is a β1 selective adrenergic receptor antagonist used to treat hypertension, angina and arrhythmia. It has a half-life of 3-6 hrs and is mainly absorbed from the upper parts of gastrointestinal tract with good stability in the acidic environment. The main objective of the present investigation was to develop a floating effervescent matrix tablets having Metoprolol as a model drug by using the controlled release polymers like HPMC K4M, HPMC K15M, HPMC K100M and Kollidon SR to increase the bioavailability of drug and reduce the dosing frequency. Fourier transform infrared studies proved that there was no interaction in the developed formulations. All the formulations remained buoyant without any disintegration. The optimized formulations F4, F8, F12 and F15 showed similar drug release to that of marketed formulation for a period of 12 hours with a similarity factor of greater than 50. To ascertain the mechanism of drug release, in-vitro data was fitted into various release kinetic models like zero order, first order, Higuchi and korsmeyer-Peppas equation which resulted in “n” value in the range of 0.65-0.88, thus indicating the mechanism of drug release followed anomalous transport with slow erosion of polymeric matrix followed by non-fickian diffusion of drug resulting in linear drug release over a prolonged period of time.

Keywords

Gastro retentive, Metoprolol succinate, floating matrix tablets, buoyancy, in-vitro dissolution.

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Bile Salt Stabilized Vesicles (Bilosomes)- A Review

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Abstract
Nowadays smart perceptions of drug delivery are introduced. It is found successful in more or less every advanced country. A Vesicular Drug Delivery S ystem (VDDS) is one of the important smart approaches in which active moieties are encapsulated in vesicular structures. Various types of VDDS are developed such as liposomes, niosomes, transferosomes, bilosomes etc. Bilosomes play a very supreme role in this account. Bilosmes may be defined as vesicles containing bile salts that prevent antigen degradation and enhance mucosal penetration. Vesicles are colloidal particles in which a concentric bilayer of amphiphilic molecules surrounds an aqueous layer. Transporter-targeted nanoparticle drug delivery systems have been developed as an emerging platform for efficient drug delivery. VDDS improves the therapeutic efficacy and reduces the side effects. With the advancement in the use of the nano-drug delivery system, bilosomes are efficiently used in the Hepatitis B immunization, treatment of acne, cholera toxin B, and targeted delivery in arthritis.

Keywords
Bilosomes, Smart Approach, Vesicles, VDDS, Nano-Drug Delivery System

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Preparation and Evaluation of Loratadine Nanocrystals for Solubility Enhancement

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Abstract
Reduction of the particle size increases the surface area thereby improves the saturation solubility and rate of dissolution of drugs. Increasing surface area of particles increases the surface free energy of the system that results in agglomeration or aggregation in the formulations. To overcome such problem stabilizing agents are added in nanocrystal formulations. Stabilizers may be of two types such as steric and electrostatic stabilizers. Nanocrystals of loratadine was stabilized by using two grades of poloxamer 188 (A) and 407 (B). Loratadine nanocrystals were prepared by varying drug and stabilizer ratio in both grades as 1:2 (S1), 1:1 (S2), and 2:1 (S3). Further these formulations were evaluated. Nano formulations AS2 and BS2 were found better formulation according to their particle size (494.9nm, 641.45nm), PDI (0.383±0.035, 0.739±0.079) and zeta potential (-4.595±0.049, -4.22±0.56). Aqueous solubility of pure loratadine was found to be 7.76× 10-4 mg/ml and after nanocrystal formulation, AS2 and BS2 showed 3-4 fold increase in solubility that is 29.78×10-4 and 19.3×10-4 mg/ml respectively. Results showed that the permeability of nanocrystals formulation AS2 was higher than BS2 as well as pure drug loratadine. Therefore, the bioavailability of the drug was enhanced by incorporating drug in nanocrystals.

Keywords
Loratidine, Nanocrystals, Poloxamer, Solubility, Stabilizer.

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Formulation and Evaluation of Bi-Layer Tablets of Nimodipine for Enhancement of Solubility

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Abstract
The poorly soluble drug necessitates administration of high dose and also leads to low bioavailability. It is possible to enhance drug solubility with solid dispersion techniques by blending highly water-soluble carriers with low-solubility drugs. Therefore, the Nimodipine bilayer tablet was made by dispersing solid dispersion in one layer and dispersing microspheres in an adjacent layer using solvent evaporation. Three different batches were prepared. F1 contained single layer tablet of polymer, Eudragit RS100. F2 was a bilayer tablet where one layer has solid dispersion and another consisting of solid dispersion and polymer. In F3, solid dispersion was incorporated in one layer while microspheres containing solid dispersion were incorporated in another layer. The comparison of release profiles were done for F1, F2 and F3 formulation. In F1 and F2 batches about 73% and 64.9% of drug release within 6hr. Whereas, in F3 formulation about 60% of drug releases within 6hr and show release up to 24hr. The results showed that F3>F2>F1 indicates an increase in dissolution rate. Therefore, F3 is better for enhancing solubility and administering once-a-day formulations.

Keywords
Bi-layer, Microspheres, Nimodipine, Solid dispersion, Solubility.

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Formulation and Evaluation of Teneligliptin Hydrobromide Hydrate Microbeads

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Abstract
Teneligliptin Hydrobromide hydrate, a DDP 4 inhibitor, is a first line drug used for the treatment of Type II Diabetes and has analogous structure to Sitagliptin. The aim of the study was to formulate Teneligliptin hydrobromide hydrate microbeads for providing stability and to minimize the side effects of the drug so that no ailments related to GIT tract occur as well as to provide stable release of the drug. Various formulations of microbeads (F1 to F6) were prepared by using polymers Gelatin and Carbopol-940 in different ratios, by external gelation method. These were then evaluated for % yield, % drug entrapment efficiency, particle size, swelling index, in-vitro drug release. On the basis of in-vitro drug release upto 24hr, the F3 formulation having polymeric ratio i.e. Carbopol-940:Gelatin;1:1.5 was identified as the best formulation. Release kinetics studies exhibited that the drug followed Korsmeyer Peppas model as the correlation coefficient was found out to be the best with a perfect fit. It was therefore inferred that the external gelation method can be used for preparation of microbeads and the formulation was able to achieve its set goals.

Keywords
Teneligliptin Hydrobromide Hydrate, Gelatin, Carbopol-934, Microbeads

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Development of Coccinia Grandis Leaves Extract Loaded Nanosponges for Anti Inflammatory Activity: In- Vitro and In- Vivo Assessment

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Abstract

Coccinia grandis leaves extract possesses anti inflammatory activity. The present study reports the development, optimization, and evaluation of Coccinia grandis leaves extract loaded nanosponges based gel for anti-inflammatory effect. This formulation was prepared by quasi emulsion solvent diffusion method using a 3^2 factorial design. Prepared nanosponges were subjected to different solid and liquid state characterizations and subsequently loaded in gel. The amount of eudragit RS100 and polyvinyl alcohol were selected as independent variables and the dependent variables were % production yield, and % entrapment efficiency. The anti-inflammatory efficacy of Coccinia grandis leaves extract loaded nanosponges was evaluated by using the carrageenan-induced rat paw edema method. Tiny, porous, and spherical Coccinia grandis leaves extract loaded nanosponges showed the drug release (82.16%) up to 8 h. The polynomial equation generated indicated that positive effect of eudragit Rs 100 and PVA on % entrapment efficiency whereas eudragit RS 100 and PVA has positive and negative effect on % production yield respectively. Further, Coccinia grandis leaves extract loaded nanosponges treated rats exhibited 12.19% inflammation inhibition compared to the control group. In conclusion, gel containing nanosponges of Coccinia grandis leaves extract showed significant anti-inflammatory activity.

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Preparation and Characterization of Bioadhesive Vesicular Based Gel for Topical Therapy of Psoriasis

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Abstract
Halobetasol is a new medication candidate for the treatment of psoriasis and dermatitis. It is a super high potential corticosteroid. The disease must be administered repeatedly over a lengthy period of time in the current therapy because to its limitations in very sluggish and poor skin permeation. 1% w/w of the HS-LG formulation was created, and it was thoroughly examined for its pH (6.4±0.02), vesicle size (460.1±0.29nm), encapsulation efficiency (81.2±0.18 %), Zeta potential (-38.8±0.3 mV), Viscosity (1120 ± 17.24 cps), and SEM with no indications of instability after storage. Appreciable cell absorption of HS-LG was discovered using in vitro and ex vivo drug permeation and histopathology studies, which were then compared to the outcomes of the commercial formulation. The topical treatment of psoriatic infections with vesicle-based gel formulations was shown to be safe, non-irritating, and more effective in a skin irritation investigation on rats.

Keywords
Halobetasol, lipogel, in vitro – ex vivo skin permeation, psoriasis infections.

Abbreviations
HS-LG: Halobetasol liposomal Gel, SEM- Scanning electron microscopy

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Formulation and Evaluation of Rifamycin Microbeads for Repurposing Its Use in Travelers Diarrhea

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Abstract
Rifamycin is the drug of 1960s has been developed with a new clinically approved use Travelers Diarrhea. Rifamycin SV clinically approved non-absorbable antibiotic with lesser adverse reactions and no chances for development of drug resistance. The present study was aimed to formulate the rifamycin SV sustained release microbeads with release of the drug in colon. The sustain released microbeads were prepared to reduce the dosage frequency and provide the more of targeted release in colon. The microbeads were prepared by ionotropic gelation method along with mixture of natural gums (xanthan gum & locust bean gum). The calcium alginate microbeads were prepared with xanthan gum and locust bean gum in different ratios to achieve the sustained delivery for upto 24hr. The formulated microbeads gives 24hr of sustained delivery of drug. The F14F formulation was found to be the best formulation amongst the other. The F14F formulation showed the minimum of 12% of drug release within 5hr and 93% of total drug release within 24hr.So, it can be concluded that produced formulation can be given once a day whereas the marketed formulation Rifamycin SVMMX® produces the maximum of 8hr release with twice a day prescription and therefore economical too.

Keywords
Travelers Diarrhea, Rifamycin SV, Microbeads, Xanthan Gum, Locust Bean Gum, Ionotropic Gelation Technique.

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Formulation and Evaluation of Transdermal Drug Delivery System of Zaltoprofen

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Abstract

The main objective of this study is to develop a Film Forming System (FFS) of Zaltoprofen (ZLT) to reduce the side effects associated with oral use of Non-steroidal Anti-inflammatory Drugs (NSAIDs) and the dosing frequency. Using solvent evaporation technique, FFS were prepared with different polymers, Hydroxypropylcelullose (HPC-EF), Eudragit L-100, Polyvinylpyrrollidone (PVP K-30) and Kollicoat MAE 100P with varying ratios (5% & 10%). SEM indicated that FFS were able to form smooth and transparent films with uniform content. The FTIR spectral analysis indicated drug-excipient compatibility. XRD and DSC studies revealed that the drug existed in amorphous state in the film. The films retained 95.8±3.07% - 99.45±0.09% drug in swab test indicating good adhesive property in both dry and wet conditions. The formulation developed using ZLT, Kollicoat MAE 100 P and PEG 400 in ethanol and isopropanol mixture displayed higher in vitro drug release of 23.588±6.96 % when compared with 5% alcoholic drug solution. The results thus obtained with the developed formulation were encouraging and warrants ex vivo studies to be performed.

Keywords

Transdermal delivery system, Zaltoprofen, Film forming system, Kollicoat MAE 100-P

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Review on Self-Nano Emulsifying Drug Delivery System (SNEDDS) and Its Pharmaceutical Application

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Abstract
In the present scenario, the vast majority of drugs are taken orally. Because of their limited bioavailability, 40% of them are poorly water-soluble, making oral delivery challenging. Pharmaceutical formulation scientists have always been concerned about inadequate water solubility, oral bioavailability, and physical stability when establishing an oral dose form. A promising new solution for tackling those challenges is the Self-Nano Emulsifying Drug Delivery System (SNEDDS). Particle size reduction and improvement in lipophilic drug solubility are the main importance of SNEDDS. SNEDDS is a fine oil-in-water nano-emulsion made up of an isotropic mixture of synthetic or natural oil, co-surfactants, surfactant which formed emulsion in aqueous medium under light agitation like GI fluid in body. The most commonly suggested drugs for SNEDDS are of BCS class II and IV. By improving the solubility of poorly soluble drugs and keeping them dispersed in small oil droplets, this formulation improves their oral bioavailability. By hardening liquid SNEDDS, the stability of SNEDDS can be further improved. This review provides us with an overview of SNEDDS, including their composition, preparation, benefits, drawbacks, and characterization. This article also explores the application of SNEDDS for improving the bioavailability of antihyperlipidemic drugs.

Keywords
Antihyperlipidemic Drugs, Nano-emulsion, Poor Bioavailability, Self-Nano Emulsifying Drug Delivery System, Solubility.

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In Situ Ophthalmic Sustained Release Drug Delivery System via Two Polymers I.E. (CARBOPOL 934 and HPMC K4M)

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Abstract
When a formulation comes into contact with tear fluid, it transforms from a solution to a gel. This is known as in situ ophthalmic medication delivery. The sol-to-gel transition occurs in the current study as a result of a ph change, which causes the medication to release over time. The two polymers (Carbopol 934 and HPMC K4M) are combined to demonstrate gelling behaviour in a pH-triggered process. The solubility of polymers and active ingredients dictated the solvent selection. When choosing a solvent, the PH of the solvent is also important. At 7.4 pH temperature and 37 C, the produced formulation containing 0.3 percent Gentamycin sulphate, 0.7 percent carbopol, and 0.6 percent HPMC K4M gelled. In compared to traditional drug delivery systems, in situ ophthalmic formulations have several advantages, including increased bioavailability and reduced nasolachrymal drug loss. Visual appearance, clarity, pH, medication content, in vitro release, antibacterial study, and stability were all assessed, with efficacious and satisfactory outcomes. Due to an increase in medication contact time with the eye, the created formulation was well received by patients and yielded positive results in conjunctivitis patients.

Keywords
In situ gelling, pH triggered, sustained ophthalmic delivery carbopol 934, HPMC K4M, Gentamycin sulphate.

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A Review on Nanoparticles Classification, Synthesis and Application

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Abstract
In recent decades, Nanoparticles (NPs) have been regarded as one of the most convenient materials. Because of their unusual designs and property compared to conventional materials, they have been called the "Material of the Twenty-first Century". NPs are growing technological in industry with applications in a wide range of fields. Currently, by using copper, gold, alginate, titanium, silver and chitosan different metallic nanomaterials are being produced. Nanoparticles are employed for a wide range of applications, including medical treatments and industrial manufacturing's have gained significance in technological advancements over their bulk counterparts due to their tunable physicochemical properties such as melting point, electrical and thermal conductivity. The NPs usually have the size range from 1 to 1000 nm but the NPs of size range 1 to 200 nm are considered better because of their small size. The four types of nanoparticles are carbon-based nanoparticles, inorganic-based nanoparticles, organic-based nanoparticles, and composite-based nanoparticles. Nanoparticles are made using a variety of processes that can be classified as bottom-up or top-down. Various measurement techniques are used to characterize nanoparticles, including size, surface area, composition, surface morphology, and surface charge. Cosmetics, electronics, catalysis, medicine, and food are all examples of nanoparticle applications.

Keywords
Catalysis, Characterizations, Nanoparticles, Technological Advancement, Thermal Conductivity.

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Stimuli-Responsive Nanogel in Cancer Therapy

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Abstract
Cancer is generally caused by the uncontrolled growth of malignant cells and it is the major death cause worldwide. There are loads of anti-cancer treatments such as chemotherapy, surgery, radiation therapy, or combination treatment, available to treat the disease. In the case of chemotherapy, chemotherapeutic agents are applied and these can interfere with the replication of cellular DNA. Nanogel is defined as a nanoparticle, that is composed of a hydrophilic polymer network, which ranges from 100 – 200 nm. Stimuli-responsive nanogels are designed to deliver the chemotherapeutic agents to the tumor sites and these are also prepared for releasing the drug suddenly upon environmental changes. The traditional chemotherapeutic agents do not specifically target the cancer cells and they may damage the healthy normal tissue with some side effects such as diarrhea, vomiting, etc. That's why nanotechnology has been developed in the form of stimuli-responsive nanogel to overcome the problems. Such photothermo-responsive nanogels possess great potential in the treatment of cancer.

Keywords
cancer, chemotherapeutic agents, nanogel, stimuli-responsive, nanotechnology.

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A Review on the Effect of Concentration of Citric Acid on Size of Graphene Quantum Dots and the Effect of pH on Yield of Graphene Quantum Dots

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Abstract
Carbon-based nanomaterials have carved out a niche as medication delivery vehicles. It's fascinating to think that a carbon nanostructure could be employed as a drug in addition to its usual function as drug delivery vehicle. Graphene quantum dots are currently in focus in this regard. Graphene quantum dots have been extensively tested for medication delivery applications and also promise for delivering drugs across blood-brain barrier. The GQDs are nanosheets with a width of 15 nm and thickness of 0.5–2.0 nm. Here we report the single- step synthesis of GQDs using pyrolysis of citric acid which produced GQDs at different pH as well as citric acid precursors of different concentrations of 0.1, 0.2, 0.5, and 1.0 M. At 250 degrees Celsius, the CA was carbonised to generate Graphene Quantum Dots (GQDs). Dynamic light scattering, FT-IR spectroscopy, UV-vis spectroscopy, and fluorescence spectroscopy were used to characterise GQDs. Transmission electron microscopy was used to examine characteristic morphology of GQDs. When CA concentration was increased, the average size of GQDs shrank. On increasing pH, the yield of Graphene quantum dots increases till a certain point but on further increasing the pH, yield starts decreasing. Bioimaging and biosensing could all benefit from these findings.

Keywords
Graphene Quantum Dots, Nanomaterials, Citric Acid, FT-IR, Transmission electron microscopy, UV-vis spectroscopy, pH

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Letrozole in Topical Nanogel: Development, Characterization and In-vitro Evaluation

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Abstract

Breast cancer is the most commonly diagnosed and frequently occurring life- threatening type of cancer considered as the second leading cause of cancer deaths amongst women globally. Development of Topical drug delivery system for breast cancer treatment for providing local as well as systemic effect of the drug and to prolong residence of drug formulation on the skin is promising but challenging. Rationale of the present investigation was to develop letrozole nanogel containing biodegradable pH responsive polymers that swells at slightly acidic tumor environment and release the drug in controlled manner enhancing their cellular uptake by concentrating drug only to the localized breast tumors by minimizing exposure to rest of the body, potentially reducing the systemic side effects occurs due to oral consumption of letrozole. FTIR spectra for drug alone and with excipients were recorded to check for the drug-excipients compatibility. LET-CNGL was formulated using modified ionic gelation method. Optimization of formulation was done using 32 full factorial design and Ccharacterized by evaluating organoleptic and morphological characteristics, gelling property, spreadability, particle size, zeta potential, % drug content, pH, viscosity, stability study, in-vitro drug diffusion and skin irritation. In-vitro cytotoxicity study was performed using MCF-7 cell lines. The drug excipients compatibility studies revealed no interaction between the drug and the screened excipients. Particle size (nm) & Zeta potential (mV) was found to be 80.45±1.91nm & -16.6 mV, %Drug content 92.28%±0.02, the mean cumulative percent drug diffusion of optimized batch was found to be 96.56%±2.64 upto 24 hrs, the IC50 values were found to be 0.8 µg/ml for prepared nanogel as compared to IC_{50} values of Letrozole and Doxorubicine taken as standard were found to be 2 µg/ml for both. Letrozole topical nanogel not only shows superior performance and better safety but it would be more appealing in better patient compliance and better retention with no irritation to the skin.

Keywords

Breast cancer, Nanogel, Letrozole, Topical drug delivery system, Anticancer.

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Formulation and Evaluation of Lipid Based Nanostructured Lipid Carriers of Poorly Soluble Anticancer Drug

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Abstract

Flutamide is a anti-androgen approved for the treatment of prostate cancer. Owing to its low solubility and high permeability, it is considered as BCS class II drug. The aim of the study was to formulate and evaluate lipid based nanostructured lipid carriers of poorly soluble drug flutamide. Flutamide loaded NLCs (Flu-NLCs) were fabricated by melt emulsification-ultrasonication technique by using Precirol ATO 5 and flaxseed oil as a solid and liquid lipid respectively. Box-Behenken design was used to identify key formulation parameters influencing particle size, PDI and % entrapment efficiency. The solubility of flutamide and flutamide loaded NLCs was determined in water, pH 1.2 buffer, pH 6.8 buffer and pH 7.4 buffer. Solubility analysis was carried out by using UV-spectrophotometer. The optimized Flu-NLCs were revealed spherical morphology with smooth surface under scanning electron microscopy with particle size of 27.66 nm, polydispersity index of 0.175 and % entrapment efficiency of 97.81±0.70%. The drug-lipid interaction was investigated by FTIR study. X-ray diffraction and differential scanning calorimetry studies showed reduced crystallinity and encapsulation of the drug within the lipid matrix. Solubility of flutamide was significantly increased when formulated as Flu-NLCs. In-vitro release study demonstrated sustained release profile of Flu-NLCs. These results indicate that Flu-NLCs may be promising carriers for the enhancement of the solubility of anticancer agent.

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Chitosan Based Polymer Lipid Hybrid Nanoparticles for Delivery of Ciprofloxacin Hydrochloride

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Abstract

Salmonella infection is challenging to treat because poor penetration and dissolution of some antibiotics leading to the development of drug resistance. In current study, chitosan based Polymer Lipid Hybrid Nanoparticles (PLNs) for delivery of ciprofloxacin hydrochloride (cip) formulated by High speed homogenization with microfluidization to improve antibacterial efficacy against Salmonella typhimurium. The prepared formulation was analysed for particles size, polydispersity index, zeta potential, entrapment efficiency, FTIR, DSC, XRD, FESEM. The results showed particle size 255 ± 4.2 nm, PDI 0.223 ± 0.01, zeta potential 35±3.4mV and entrapment efficiency 78.6 ± 5%. Because of the application of the microfluidization technique, the best particle size reduction and monodispersed behavior were seen. Positive zeta potential with more value signifies good stability of prepared formulation. FTIR studies demonstrated drug compatibility with the polymer and lipid carriers. DSC and XRD analysis verified the presence of amorphous PLNs. The FESEM results demonstrate that all of the samples have a rough surface with a nearly spherical shape. The formulation was further tested for antibacterial activity against Salmonella typhimurium in vitro. The zone of inhibition, minimum inhibitory concentration, and minimum bactericidal concentration of cip-PLNs at concentration 10µg/ml were 48 ± 2.3 mm, 0.12 µg/ml, and 0.06 µg/ml, respectively, which was better than the results of pure ciprofloxacin hydrochloride (41 ± 1.2 mm, 0.24 µg/ml, and 0.12 µg/ml). The results of in-vitro antibacterial studies revealed synergistic effect of ciprofloxacin hydrochloride with chitosan in PLNs. As a result, chitosan based PLNs of ciprofloxacin hydrochloride may be a promising formulation with high antibacterial potential for the effective treatment of typhoid.

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Nanogel in Topical Application: An Overview

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Abstract
Nanotechnology has become a promising career in the field of drug delivery systems. Nanogels are one of those formulations, which can be used topically to treat various antifungal, antibacterial, autoimmune disorders and skin infections such as dermatitis, psoriasis, acne, etc. Nanogels have many advantages over other formulations due to their high drug loading capacity and temporal release of the drug which makes a convenient delivery system for topical use. The crosslinking of the polymers influences the incorporation and entrapment efficiency of biomolecules which makes it more stable than other dosage forms. The optimization of the Nanogel formulation can be done by various design methods such as Box-Behnken design, Plackett Burman design, and factorial design in which factors such as polymer ratio, surfactant, and lipid play a very important role. The release pattern of Nanogel depends upon the nature of the polymers, their ratio, and the strength of conjugation with the incorporated active ingredient. In topical application, it is very active and opened an era for the same.

Keywords
Nanogel, drug release, optimization, crosslinking, Topical application

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Nanogel in Ocular Drug Delivery

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Abstract
Ocular drug delivery is a type of drug delivery system or dosage form that is intended for delivering, administering, or instilling the drug or the medication into the eye against a disorder or an ailment involving or affecting vision. Several formulations have been intended for the same. Recently, new technologies have arrived in creating nanogels by combining the advantages of nanoparticles and hydrogels. Nanogel is none other than a nanoparticle composed of the hydrophilic polymer network, ranging from 100 – 200 nm. It has swellable and degradation properties with drug loading capacity, sustained and targetable manner, large surface area, high stability, etc. Inspired by the unique properties of nanogels, profound research is going on it in ocular applications. There are some advantages of this drug delivery like prolonged drug release or better efficacy, increased ocular residence, improved bioavailability, less visual and systemic side effects, increased shelf life, accurate dose in the eye, etc. For topical ophthalmic drug delivery systems, intraocular pressure has always been a great challenge. By modifying the biodegradable nanogel system and fine-tuning its composition, optimal drug loading and controlled release for ocular drug delivery can also be achieved.

Keywords
Ocular drug delivery system, Nanogel, Polymer network, Swellable, Sustained, Biodegradable.

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Formulation and Characterization of Nanoemulsion Based Gel for Skin Cancer

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Abstract

Nanoemulsion system is effective drug delivery system intended to enhance the solubility and bioavailability of lipophillic drugs.

Objective: The purpose of proposed investigation was to develop, characterize nanoemulsion based gel for topical drug delivery and to improve permeation.

Method: Nanoemulsion bearing Imiquimod was formulated by application of ternary phase diagram and spontaneous emulsification method. Nanoemulsions were characterized for Particle size, Zeta potential, Drug content, physical stability etc. The optimized nanoemulsion was incorporated into gel and evaluated for Particle size distribution, zeta potential, Drug content, Viscosity etc. Furthermore Ex vivo permeation studies, Irritation studies (HET tests), MTT assay and stability studies were performed

Result: The optimized nanoemulsion exhibited globule size 180.2 nm, pI 0.334 and zeta potential -35.46 mV. Nanoemulsion based gel showed globule size 156nm and zeta potential -37.9 mV significantly higher ($P<0.05$) diffusion compared to marketed cream. Formulation does not exhibit any skin irritation by HET's test. A significant higher ($P<0.05$) in vitro anticancer potential was observed compared with Imiquad cream. Similarity factor of 85.45 indicated stability of formulation for period of 3 months.

Conclusion: The results suggested that prepared nanoemulsion based gel exhibited stability and can be used to promote skin penetration of IMQ.

Keywords

Nanoemulsion, Skin cancer, Gel, Particle size

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Role of Natural Polymers in Nanotechnology

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Abstract

In the enormous field of nanotechnology, polymer-based nanocomposites have become a noticeable region for research and development. Polymer nanocomposites include a co-polymer or polymer that have nanoparticles dispersed into the polymer lattice. Important contributions of nanotechnology in the production or formulation of coating material, sealants, adhesives, encapsulation materials have been a great success in the drug delivery system. Polymers have wide scope of uses so choice of polymers is the principal step in planning any measurement structure. These days, because of numerous issues related with drug delivery system in results manufactures are slanted towards utilizing natural polymers. Polymers are essentially polysaccharides so they are biocompatible and without any side effect. This review will detail some natural polymers and there significant towards nanotechnology and also include other important areas including need of natural polymer, specific points and use of natural polymer.

Keywords

Polymer, Natural Polymers, Nanotechnology, API, Excipients, Drug delivery system.

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Nanostructured Lipid Carriers (NLC) in Topical Delivery

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Abstract
Nanotechnology has gained tremendous popularity over the years due to therapeutic efficacy, particularly for targeted drug therapy. Nanocarriers have achieved a forefront with several potential applications in drug delivery and research. Among them, Nanostructure lipid carriers have achieved importance. Nanostructured lipid Carriers or NLCs are novel pharmaceutical formulations that are mainly composed of physiological and biocompatible lipids, surfactants, or co-surfactants. NLC can be formulated by melt emulsification – ultrasonic technique and optimized by taking many different solid lipids: Liquid lipid ratio, Drug concentration, Lipid phase, aqueous phase ratio, etc. as independent variables and particle size and entrapment efficiency as the dependent variable. As nanocarriers, Nanostructured Lipid Carriers (NLC) have emerged as novel systems composed of physiological lipid materials suitable for topical, dermal, and transdermal administration. They can be well used for the treatment of any kind of fungal infection. They are also having satisfactory stability, skin permeability, and retention. Hence it can be said that Nano-Structured Lipid Carriers (NLC) have shown a new era in the therapy of skin infections.

Keywords
Nanostructured Lipid Carriers (NLCs), Surfactants, Co-surfactants, melt emulsification – ultrasonic, Independent Variables, Dependent Variables, Antifungal Drug.

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Nano-Emulgel in Topical Application: An Effective Drug Delivery System

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Abstract
The delivery of lipophilic drugs is a very challenging aspect of the delivery system. Nanoemulgel formulations are suitable for overcoming those difficulties because of their dual nature. It is a combination of two different delivery systems, the nanoemulsion system, and the hydrogel system. Both the systems have some drawbacks but nanoemulgel can overcome those. In the case of topical drug delivery, nanoemulgel acts as a drug reservoir. It is extensively used in the treatment of acne, pimple, psoriasis, fungal infection, and inflammation caused by osteoarthritis and rheumatoid arthritis. The hydrophobic drug which is difficult to deliver in the biological system, can be delivered via nanoemulgel. It provides an enormous surface area for better penetration of therapeutic agents into the pilosebaceous region, resulting in better efficacy. It shows a better spreading capacity and less stickiness hence patient's acceptability is more. Due to all these properties, it can be well considered an alternative to the conventional formulations of the hydrophobic drug delivery system

Keywords
Nanoemulgel, Nanoemulsion, Hydrogel, Topical Application, Hydrophobic

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Quality By Design (Qbd) Based Approach for the Optimization of Dasatinib Loaded Liposomes Through Sublingual Route

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Abstract

Cancer is a leading cause of death worldwide, accounting for nearly 10 million deaths in 2020. Dasatinib is an anticancer drug used in imatinib resistance and /or intolerance, as well as in the frontline setting in patients with myeloid leukemia-chronic phase. Dasatinib is a BCS Class II drug, with poor solubility and high permeability, suffering with a major drawback of low oral bioavailability with only 14 to 34 % which is due to metabolization in the liver, mainly by the Cytochrome P450 isoenzyme (CYP3A). The systemic administration of the free drug is considered to be the main clinical failure of chemotherapy in cancer treatment, as limited drug concentration reaches the tumor site. Most of the active pharmaceutical ingredients used in chemotherapy are highly cytotoxic to normal cells. Liposomes are considered as one of the targeted drug delivery systems, consisting of spherical vesicles characterized by a bilayer of lipids with an aqueous cavity. Delivery of therapeutics by liposomes proved to alter the bio distribution profile of a drug. The purpose of this study was to extend QbD principles to liposomal formulation containing a lipophilic drug to demonstrate both the feasibility and the advantages of applying QbD concepts. In the present investigation, a quality by design (QbD) principles were successfully applied to the formulation of liposomes encapsulating a lipophilic drug. The effects of the processing variables on the particle size, encapsulation efficiency and in-vitro drug release of drug loaded liposomes (prepared using ethanol injection method) were investigated.

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Formulation and Characterization of Nanoemulsion Based Gel for Skin Cancer

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Abstract

Nanoemulsion system is effective drug delivery system intended to enhance the solubility and bioavailability of lipophillic drugs.

Objective: The purpose of proposed investigation was to develop, characterize nanoemulsion based gel for topical drug delivery and to improve permeation.

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Result: The optimized nanoemulsion exhibited globule size 180.2 nm, pI 0.334 and zeta potential -35.46 mV. Nanoemulsion based gel showed globule size 156nm and zeta potential -37.9 mV significantly higher ($P<0.05$) diffusion compared to marketed cream. Formulation does not exhibit any skin irritation by HET's test. A significant higher ($P<0.05$) in vitro anticancer potential was observed compared with Imiquad cream. Similarity factor of 85.45 indicated stability of formulation for period of 3 months.

Conclusion: The results suggested that prepared nanoemulsion based gel exhibited stability and can be used to promote skin penetration of IMQ.

Keywords

Nanoemulsion, Skin cancer, Gel, Particle size

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An Amalgamation of Self-Nanoemulsifying Drug Delivery System (SNEDDS) with 3D Printing Technology: Current Status and Future Potential in Pharmaceutical Manufacturing

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Abstract
Oral route of drug administration is commonly used route due to its advantages such as most convenient, safest, most economical and non-invasiveness that leads to patient compliance. However enzymatic degradation, poor permeation, first pass metabolism, P-gp drug efflux, etc are drawbacks of such route. Additionally most of new chemical entities faces the problem of poor aqueous solubility resulting in reduced bioavailability and therapeutic effect. Nowadays, nanotechnology has been extensively explored by researchers to alleviate such problems. Among all the lipid nanoformulations focus has given to SNEDDS as it overcome drawbacks associated with oral route of drug administration. Marketed formulation of SNEDDS available are Neoral®(cyclosporine), Lipirex®(fenofibrate), etc. However manufacturing of these formulations seems to be complex, time consuming, and expensive. Therefore exploring new horizon of manufacturing is necessary for current pharmaceutical industries. One of such horizon could be 3D printing technology. Utilization of such technology in pharmaceutical manufacturing was recognized only after the first FDA approved 3D printed tablet Spritam® (levetiracetam) launched into the market manufactured by Aprecia Pharmaceuticals using 3D ZipDose® technology. After an extensive literature review an insight was made to bridge knowledge from experimental space to industrial applicability of such technology in manufacturing of SNEDDS formulation.

Keywords
Oral Route, Poor Solubility, First Pass Metabolism, SNEDDS, Market Formulation, Pharmaceutical Manufacturing, 3D Printing Technology

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Pharmacosomes a Novel Vesicular Drug Delivery System for Poorly Soluble and Poorly Permeable Drugs

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Abstract

Novel drug delivery system aims to achieve the desired concentration to release the drug at targeted site by using carrier systems, altering the structure and microenvironment around the drug. Especially drugs which are having narrow therapeutic window are difficult to formulate, but with the advantage of novel drug delivery systems like particulate, polymeric carrier, macromolecular and cellular carriers they could be loaded for a targeted delivery. In novel vesicular drug delivery systems drug binds covalently to the lipid molecule (Phospholipid) by which the drug release is in a controlled and sustained manner. The drugs which are facing difficulties like low solubility and low permeability can be effectively formulated and can achieve required pharmacokinetic and pharmacodynamic parameters. Pharmacosomes are colloidal drug dispersions attached covalently to the phospholipid. The term "Pharmaco" means drug and "Soma" means carrier. These are prepared by hand shaking method, ether injection, solvent evaporation method, anhydrous co-solvent lyophilyzation, supercritical fluid approach and other alternative approaches. They are characterized for complex determination by FTIR spectrophotometry, surface morphology by SEM analysis, drug entrapment by ultracentrifugation, solubility, drug lipid compatibility, crystal state measurement by XPD, dissolution studies and in vitro drug release rate.

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Influence of Physical Properties of Carriers on the Performance of Dry Powder Inhalers

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Abstract
Pulmonary administration of dry powder formulation presents several advantages in treatment of many diseases. Micronized drugs with or without carriers are commonly seen in dry powder formulations. Since micronized drug particles are generally very cohesive and tend to aggregate, they exhibit poor aerosolization performance. Therefore, drug particles are usually mixed with coarse and fine carriers to increase aerodynamic behaviour and flow properties of drugs and ensure accurate dosing of drugs. At present several excipients such as sugars, amino acids, surfactants, cyclodextrins, lipids, and force control agents have been used to improve the performance of dry powder inhalers. Almost all inhalation powders contain mainly α-lactose monohydrate as a carrier. The aerosol performance of Dry Powder Inhalers (DPIs) is profoundly influenced by characteristics of carriers, such as particle size and size distribution, density, shape and surface properties, etc. The micronized drug powder is blended with large excipients through a process known as adhesive mixing. Drug particle is attached to the coarse surface of free-flowing particles through adhesive mixing so that the Active Pharmaceutical Ingredients (API) can be more easily "transported" with better handling. This abstract presents, different carriers and the influence of their characteristics on the performance of dry powder formulations.

Keywords
Carriers, Dry powder inhalers, Particle size, Shape, Surface properties

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Recent Advances and Challenges in Gastroretentive Drug Delivery System

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Abstract
Oral path has been mostly preferred mehod for drug delivery to the gastrointestinal area and used for systemic drug administration to the gastrointestinal area and can also be used for both systemic drug administration and for curing local gastrointestinal problems . mostly chosen by method by the patients, because of its convenience and also the comfort of use and benefit of self –treatment. it can also be made to improve the drug delivery to specific sites in the upper region or lower region of gastrointestinal tract. upper gastrointestinal region have mouth, pharynx ,oesophagus stomach and the number one part of the small intestine . (i) But benefit has not produced in various of important drugs that are active in locally in stomach (ii) are with good absorption window in in stomach and upper gastrointestinal area (iii) are not stable in intestine or colon (iv) have low solubility and gastric retention time [2].Various type of disadvantages forced researchers to develop gastroretentive drug delivery system (GRDDS) .

Keywords
grdds, oral ,colon, systemic, pharynx

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A Comprehensive Review on Probiotics: Organisms for Life

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Abstract
Probiotics, live cells with multiple recipient characteristics, have been extensively examined and investigated commercially in numerous distinctive ways within the world. Their benefits to human and creature wellbeing have been demonstrated in hundreds of logical investigate. Lactobacillus and Bifidobacterium are the most probiotic bunches, in any case, there are reports on the probiotic potential of Bacillus, Yeasts, Pedi coccus & Lactococcus. A few of the recognized probiotic strains display capable anti-inflammatory, antiallergic and other vital properties. The contribution of probiotics in preventing and treatment of diabetes, obesity, cancer and other diseases related to pathogenic microbes is an exciting and rapidly advancing research arena. Separated from that, the utilization of dairy and non-dairy items invigorates the resistance totally different.

Keywords
Probiotics, Organisms, Diabetes, Cancer, Obesity, Bacteriotherapy, Microbes.

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Drug Resistance Pattern to Antiretroviral Therapy in People Living with Human Immuno Deficiency Virus: A Global Review

MANIPAL ACADEMY of HIGHER EDUCATION
(Deemed to be University under Section 3 of the UGC Act, 1956)

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Abstract

Background: Worldwide, Drug Resistance to Antiretroviral Therapy (ART) in Human Immuno Deficiency Virus disease is a major health concern leading to the failure of treatment or making the drug less efficacious. Drug resistance occurs due to the mutation of the HIV Virus. Mutations are the amino acids substitutions that occur in the HIV genome.

Objective: This review focuses on comparing drug resistance mutation shown by each class, different treatment therapies, free ARTs provided by different countries and subtypes of HIV virus between different countries.

Methods: Drug resistance to antiretroviral therapy in Human Immunodeficiency virus was the search criteria. Articles from Pubmed and HIV guidelines of British HIV Association, China, US FDA, Russia, India, Peru, Iran, Brazil, and South Africa were referred.

Results: Drug resistance mutations vary among countries such as South Africa, Brazil, United States, India etc. Treatment is provided based on the drug resistance mutation. K103N is the most common mutation shown against NNRTI drugs, whereas M184V was the most common mutation shown against NRTI. L90M and M46I were also found to be the most common mutation shown against PI.

Conclusion: Drug resistance is associated with all classes of ART drugs. Despite the advent of many ART drugs, drug resistance is enhancing day by day. Adherence to ART therapy is significant because of the immensely replicating virus nature. Also, this review emphasizes the need for regular testing of plasma samples of patients for DRMs to detect and replace a failing regimen early, and the use of HIV drug resistance genotyping of ART naïve individuals prior to initiating first-line ART for possible transmitted resistance.

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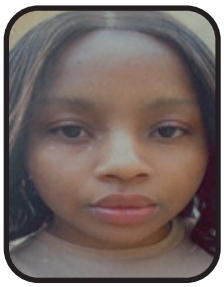
Evaluating the Drug Prescribing Pattern of Pediatrics in a Health Facility in Nigeria



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Abstract

Background: The irrational prescribing of drugs can lead to polypharmacy, increase the risk of drug therapy problems and increase the rate of antimicrobial resistance.

Method: A cross-sectional study using patients' medical records who attended the outpatient pediatric clinic of Bingham University Teaching Hospital from the 1st of January to the 30th of April, 2022. The WHO prescribing indicators and guidelines for the investigation of drug use in health facilities were used.

Result: 554 prescriptions met the inclusion criteria and were used. A total of 1890 drugs were prescribed, with an average number of drugs per prescription of 3.4. 81.4% of the prescriptions had at least one antibiotic prescribed, and the percentage of encounters with injection was 17.5% (97 patients). Prescribing by generic name was done for 975 (51.6%) drugs, and of the 1890 drugs prescribed, 1693 (89.6%) drugs were from the WHO Pediatric Essential Medication List.

Conclusion: There is a continuing crisis of irrational prescribing among medical practitioners in Nigeria.

Keywords

WHO prescribing indicators, irrational prescribing, prescription pattern

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Population Pharmacokinetics of Rifampin in Non-HIV Infected Pulmonary Tuberculosis Patients of South India

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Abstract

Rifampin is the first-line drug used in tuberculosis and has shown high variations in the pharmacokinetic profile in different populations. The dosing schedule of this drug is done empirically by the physicians with their experience and then adjusted based on the therapeutic outcome of the patients. Population Pharmacokinetic analysis is a unique approach to design a drug dosage regimen for a particular ethnic group and tailoring a dosage regimen to an individual patient. A prospective open-label study was conducted in Nilgiris District in South India through DOTS centers. A total of 35 patients were included in the study and blood samples were collected at different time-windows. The plasma drug concentration of samples for the drug was analyzed using HPLC and population pharmacokinetics was estimated using NONMEM software. The results have shown that the clearance of Rifampin in these study patients was significantly less than the values found in the literature. The body weight of the patients should be taken as a covariate to calculate the clearance of the individual patient in this population. The volume of distribution was also found less than the values of different other populations. However, no covariate influenced the volume of distribution of Rifampin in this study population.

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Green Hydrotropic Technology

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Abstract
For an analytical procedure, the most crucial step is the solubilisation of the poorly soluble or sparingly soluble drugs. Therefore the solvent used should be safe, non-toxic, cost effective, and environment friendly. Number of methods can be applied that can be used for enhancement of their solubility in aqueous medium. The major drawback of using organic solvents is associated with their high volatility and their toxicity and cost. A green, convenient and alternative method is Hydrotropy. The method used to improve the solubility of water- insoluble and sparingly soluble organic compounds in aqueous medium is known as Hydrotropy. Some examples of the hydrotropes solvents are derivatives of Urea, organic metal salts and acids, anionic and nonionic aromatic alcohols, alkaloids, aromatic cationic solutes, and anionic, cationic, nonionic, and amphoteric surfactants.

Keywords
Hydrotropy, Sparingly Soluble, Amphoteric Surfactants.

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Screening of Novel Structural Analogues of Ethacrynic Acid for Diuretic Effect

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Abstract

Most of the natural compounds particularly polyphenolic compounds possess alpha, beta unsaturated carbonyl unit. Ethacrynic acid is a synthetic agent with alpha, beta unsaturated carbonyl unit, found with diverse biological responses such as diuretic, anticancer, antiviral, anti-infective anti-malarial. Novel structural analogues of ethacrynic acid were synthesized and examined for diuretic effect. Ethacrynic acid is a highly effective loop diuretic agent. In this research we have succeeded in developing novel structural analogues of ethacrynic acid with high level of diuretic response. Designed and synthesized compounds were screened for diuretic effect in albino wistar rats using ethacrynic acid as standard drug. Molecular docking was done to determine binding mode and affinity of novel molecules with the receptor. Structures of novel synthesized molecules were confirmed by spectral characterization such as FTIR, ^{1}HNMR, ^{13}CNMR. ADME studies were done to assure drug like behaviour of compounds. Results of biological investigation suggested that all compounds having diuretic activity. Compound F1, F2 possesses good diuretic activity where as compound F6 was found with the highest level of diuretic response. The research studies were found to be helpful for further development of new agents with high therapeutic eficasy of diuretic effect

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Formulation and Evaluation of Transdermal Drug Delivery of Anti Emetic Drug

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Abstract

In the present study, an attempt was made to develop transdermal film of Prochlorperazine maleate by solvent casting method intended for treatment of chemotherapy induced nausea and vomiting and selection of most satisfactory formulation by ex vivo evaluation. Drug-excipients incompatibility study was carried out using Fourier Transform Infrared Spectroscopy (FTIR) which shows that drug and excipients were compatible to each other. transdermal film of Prochlorperazine maleate containing Hydroxy Propyl Methyl cellulose K4M, Hydroxy Propyl Methyl cellulose K15M and glycerin were developed by solvent casting method. An optimized formulation was having excellent appearance, transparency, % elongation, tensile strength, folding endurance and ex vivo drug release. Batch F8(4%) (50:50) shows maximum ex vivo drug release with a maximum time. Glycerin (20 % w/w) was used as the plasticizer which provide good elasticity to the film. Stability studies of an optimized batch showed no significant change in appearance, elasticity, folding endurance and in vitro drug release after storage at 40 ±2 oC and 75±5% RH and 30±2˚C and 65±5 % RH for a period of one month. This approach suggested that the transdermal film of Prochlorperazine maleate using Hydroxy Propyl Methyl cellulose K4M(2%) and Hydroxy Propyl Methyl cellulose K15M(2%) gives more sustain release action in around 12 hours and may decrease the dosing frequency of the drug in management of chemotherapy induced nausea and vomiting.

Key Words

Transdermal Film, Prochlorperazine Maleate, Solvent Casting Method, Hydroxy Propyl Methyl Cellulose K4M, Hydroxy Propyl Methyl Cellulose K15M(2%), Sustain Release Action.

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HPTLC Method Development and Validation for Simultaneous Estimation of Naproxen and Pomegranate Peel Extract in Combined Dosage

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Abstract

The High Performance Thin Layer Chromatography (HPTLC) is very simple yet accurate cost effective method for simultaneous estimation of various drugs. Pomegranate Peel Extract (PPE), a herbal extract reportedly shows efficient anti-arthritic properties was estimated simultaneously with Naproxen, a highly used Non-steroidal Anti Inflammatory Drugs (NSAIDs) for the treatment of Osteoarthritis. For the estimation, reflection or absorbance mode was 240 nm and chosen stationary and mobile phase were Precoated silica gel G60 F254 aluminium sheets (10 x 10 cm) and ethyl acetate: toluene: methanol(4:5.5:0.5 v/v/v) simultaneously. According to ICH Q2 (R1) guidelines, the developed method was validated for linearity, accuracy, precision, limit of detection, specificity, limit of quantification and robustness. The Rf value of Naproxen was 0.52 ± 0.01 and regression equation was y = 3.5847x + 253.22 with 0.9953 correlation coefficient, while Pomegranate Peel Extract had Rf value of 0.83 ± 0.01 and regression equation was y = 3.5371x - 124.28 with 0.9928 correlation coefficient. The validation results showed that the developed method was robust, accurate and precise to perform estimation of chosen drugs.

Keywords

Pomegranate Peel Extract, Naproxen, high-performance thin-layer chromatography, simultaneous estimation, validation.

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Formulation and Evaluation of Mouth Dissolvinng Tablet of Anti Migraine Drug

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Abstract

In present study, an attempt was made to develop a mouth dissolving tablet of Almotriptan malate for the treatment of migraine by three different method direct compression method, Sublimation method, Wet granulation method. Selection of satisfactory formulation by in vitro evaluation. Cross povidone, cross carmellose sodium and sodium starch glycolate was used as super disintegrant. Drug excipient compatibility Study was carried out by fourier transform infrared spectroscopy which shows the drug and excipients are compatible to each other. An optimized formulation was having excellent appearance and proper hardness, thickness and in vitro dissolution time by releasing 100.06% in vitro drug release in 12 min in PBS pH 6.8. The in vitro disintegration time was found to be 21 sec and it was found that there was no residue remain after disintegration in media. Stability study of an optimized batch shown that there was no significant change in hardness, in vitro disintegration time and in vitro drug release study after storage at 40º ± 2ºC and 75 ± 5% RH for a period for 1 month. This approach suggest that Mouth dissolving tablet using cross povidone (7.5% w/w) by direct compression method gives quick on set of action at around 21 sec and improved patient compliance for treatment of migraine.

Key words

Mouth Dissolving Tablet, Almotriptan Malate, Direct Compression Method, Cross Povidone, Quick on Set of Action

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Formulation and Evaluation of Sublingual Thin Tilm for Management of Migraine

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Abstract

In the present study, an attempt was made to develop fast dissolving sublingual thin film of Almotriptan malate by solvent casting method intended for treatment of migraine and selection of most satisfactory formulation by in vitro evaluation. Drug excipients compatibility study was carried out using Fourier Transform Infrared Spectroscopy (FTIR) which shows that drug and excipients were compatible to each other. Sublingual thin film of Almotriptan malate containing Hydroxy Propyl Methylcellulose E5LV and glycerin were developed by solvent casting method. An optimized formulation was having excellent appearance, transparency, % elongation, tensile strength, folding endurance and in vitro disintegrating time by releasing more than 98% drug within 7 minutes in pH 6.8 phosphate buffer. The in vitro disintegrating time was found to be less than 60 sec and it was found that no residue remained after disintegration in the media. Film also showed pleasant taste. Glycerin (40 % w/w) was used as the plasticizer which gave good elasticity to the film. Stability studies of an optimized batch showed no significant change in appearance, elasticity, folding endurance and in vitro drug release after storage at 40 ±2 degree C and 75±5% RH and 30±2oC and 65±5 % RH for period of two months. This approach suggested that the fast dissolving sublingual thin film of Almotriptan malate using Hydroxy Propyl Methylcellulose E5LV and glycerin gives quick onset of action in around 60 seconds and improved patient compliance in management of migraine.

Key words

Sublingual thin film, Solvent casting method, Almotriptan malate, Acute migraine, Quick onset of action

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Formulation Development and Evaluation of Bilayer Matrix Tablet of Diclofenac Potassium and Famotidine

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Abstract
In order to create a single tablet containing two different classes of medications that is frequently prescribed by doctors and to improve patient compliance, the current study aims to formulate and evaluate bilayered tablets containing diclofenac potassium in the Sustained Release (SR) portion and famotidine in the Immediate Release (IR) portion. The wet granulation method was used to create the sustained release layer of diclofenac potassium utilising a mixture of carbopol 934 and HPMC K100M in various proportions, as well as additional excipients such magnesium stearate and PVP K30. Direct compression was used to create the famotidine immediate release layer. The flow characteristics of the powders were tested, and the physical parameters of the completed tablets were analysed. Using a USP-XXII paddle type dissolution apparatus, the drug release study of famotidine and diclofenac potassium was assessed. Famotidine's release rate was investigated for 45 min using phosphate buffer pH 1.2 as the media, while diclofenac potassium's release rate was investigated for 2 hours using 1.2pH buffer and then for 6 hours using phosphate buffer media at pH 6.8. At 45 minutes, more than 80% of the famotidine in all formulations had been released. In the instance of tablets made from carbopol 934 and HPMC K100M, the release was reduced as the polymer content increased. Each medicine has been produced in a total of 9 batches in order to achieve a stable and reliable formulation. Additionally, the product stability studies follow ICH guidelines.

Keywords
Diclofenac potassium, Famotidine, Polyvinyl pyrollidone K-30, Carbopol 934, HPMC K100M ,Wet granulation, Direct compression, Bilayer tablet

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Optimization and Evaluation of Colon-Specific Matrix Tablet of Piroxicam for Inflamatory Bowel Disease

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Abstract

Present study is intended to formulate and evaluate the Piroxicam (PXM) colon-specific enteric-coated matrix tablets using time-dependent polymershydroxypropyl methylcellulose K4M and PH-sensitive Eudragit S100 that delays the release of drug (PXM) in the upper gastrointestinal system and also helps in the continous release of PXM in colon area in Inflammatory Bowel Disease (IBD). Enteric-coated tablets containing a combination of the above polymers can prevent PXM from entering the upper gastrointestinal system (i.e. stomach and small intestine).A promising system for delivering PXM to the colon was found in the in-vitro drug release studies with formulation F10. The zero-order model was best fitted for the release pattern of the above formulations. The mechanism involved in drug release was a non-fickian (super case-II) transport system. There was no interaction found in the FTIR spectral studies between the PXM and the excipients, concluding the development of HPMC K4M-Eudrgit S100 enteric-coated tablet as a viable strategy for treating inflammatory bowel disease by targeting the PXM in colon.

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Formulation and Evaluation of Fast Dissolving Tablet of Famotidine by Using Naturally Obtained Superdisntigrant Wounds

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Abstract

Oral drug delivery has been known for decapods as the most classical utilized route of administration among all the routes that have been explored for the systemic delivery of drugs via different pharmaceutical products of different dosage forms. The reason that the oral routes accomplish such popularity may be in part aspect to its ease of administration as well as the conventional belief that by oral administration the drug is as well absorbed as the food materials that are consume daily. In fact, the development of pharmaceutical products for oral delivery, regardless of physical form involves varying extents of optimization of dosage form characteristics within the intrinsic constraints of GI physiology.

Therefore, a elemental understanding of various castigate, including GI physiology, Pharmacokinetics, Pharmacodynamic and formulation design are essential to compile a systemic approach to the successful development of an oral pharmaceutical dosage form. In any case, the scientific frame work required for the successful development of an oral drug delivery system include of a basic understanding of the following three article: Physicochemical, pharmacokinetic and Pharmacodynamic characteristics of the drug. This review focuses on various synthetic superdisintegrants, natural superdisintegrants from different plant sources, co-processed Excipient blend and their efficiency.

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Nitrosamine Impurities: A Validated LC-MS/MS Method for Determination at Trace Level in Doxofylline API

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Abstract

Current method describes trace level quantification of nitrosamine impurities (NDEA, NDIPA, NDIPA, NEIPA, NMPA, NDBA, NDMA and NMBA) in Doxofylline API. The set of nitrosamine impurities were made to separate using Symmetry C18 (150X4.6 mm, 5µm) with the set flow rate of 0.8mL per min. Column oven was saturated to attain a temperature of 40º±1.0º C, whereas auto sampler was kept ambient. Separation was obtained by employing gradient program (0.1%w/v formic acid and methanol) throughout the run time of 14 min. 1200µl of rinse volume was used before and after aspiration with 5 sec of dip time. All the nitrosamine impurities were quantified and ionised in positive polarity mode of APCI using Multiple Reaction Monitoring (MRM). Ionization $(M+H)^+$ values were aquatinted as m/z 75 (parent), m/z 58 (Product), m/z 103 (parent), m/z 47 (Product), m/z 131 (parent), m/z 89 (Product), m/z 117.1 (parent), m/z 74.8 (Product), m/z 147.1 (parent), m/z 117 (Product), m/z 137 (parent), m/z 66 (Product), m/z 159 (parent), m/z 103 (Product), m/z 267.2 (parent), m/z 181.1 (Product) respectively for NDMA, NDEA, NDIPA, NEIPA, NMBA, NMPA, NDBA and Doxofylline. Retention times of the impurities NDMA, NDEA, NDIPA, NEIPA, NMBA, NMPA, NDBA and Doxofylline were found to be 4.04, 6.83, 8.97, 7.98, 4.92, 9.25, 11.06 and 7.15 min respectively. Percentage Individual impurity in un spiked test solution has not been detected with any of the impurities. Correlation coefficient (r^2) for individual impurity was found to be between 0.996-1.000. Limit of detection (DL) and limit of quantification (QL) were established based on signal to noise ratio which was found between the range of 0.0040µg mL^{-1}-0.0174µg mL^{-1} and 0.0060µg mL^{-1}-0.0262µg mL^{-1} respectively.

Keywords

NDMA, Doxofylline, NDEA, Nitrosamine impurities, APCI

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Formulation and Evaluation of Dry Syrup of an Antiretroviral Drug

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Abstract
The aim of present investigation was to formulate and evaluate dry syrup of an anti retroviral drug Nevirapine. As Nevirapine is BCS class II drug, to improve solubility β-cyclodextrin was used. To investigate complexes phase solubility studies performed in both 0.1 N HCL and 6.8 pH phsosphate buffer. Phase solubility studies indicating that AL type curve obtained that means complexation follows K1:1. For complexation of drug three methods used, among them kneading method given better results. By using complexed drug dry syrup was prepared. In the dry syrup formulation poloxamer-188, hydroxyl ethyl cellulose were used as wetting agent, stabilising agent, dispersing agent. The concenstrations of 1%, 3%, 5% of poloxamer 188 and 1%, 1.5% , 2% of HEC were selected. Dry syrup evaluated for flow properties like angle of repose and Hausner's ratio before reconstitution. Dry syrup evaluated after reconstitution for the following parameters like drug content, Invitro dissolution study, Dispersibility, Redispersibility, pH, Viscosity, Sedimentation volume and Time taken to disappear bubbles. F2 batch containing poloxamer 3% and HEC 1% was optimized. Accelerated stability studies conducted at 40±2°C/75±5% RH for one month. After one month storage under accelerated conditions dry syrup was evaluated before and after reconstitution. Assay and pH were evaluated periodically within a week after reconstitution. From stability studies the prepared dry syrup found to be stable.

Key words
Dry syrup, Antiretroviral drug, Phase solubility study, β-cyclodextrin, kneading method, Evaluation.

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N-acetyl-L-tryptophan Alleviates Ionising Radiation-induced Neuro-inflammation and Cell Death in Neuro2a Cells

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Abstract
Deleterious effects of ionizing radiation on the Central Nervous System (CNS) are not well understood convincingly. Radiation exposure during medical procedures and astronauts in deep space or accidental radiation overexposure may cause severe brain damage. Substance-P (SP) is involved in inflammatory diseases i.e., respiratory, gastrointestinal and radiation induced cell death. Therefore, NK1R antagonist could be a possible strategy to inhibit substance-P mediated NK1R activation pathways that will help in cellular proliferation and inhibiting inflammation to achieve radioprotection. Therefore, present study was conducted to evaluate the role of N-acetyl-L-tryptophan (L-NAT) as radioprotective agent in neuronal cells. Results of the study demonstrated that cells pretreated with L-NAT has (MTT and CFU assay) significant (~80%; $p<0.001\%$) radioprotective effect in irradiated (LD50 IR dose) Neuro2a cells. However, CP96345 pretreatment has shown compromised radioprotective effect (~65%; $p<0.001\%$) as compared to L-NAT pretreatment. Gamma radiation induced neuro-inflammation and L-NAT pretreatment helps in the subsequent maintenance of Th1/Th2 cytokines homeostasis, was investigated using inflammatory cytokine study i.e., IL-6, IL-12, IFN-α, TNF-α, ICAM-1 and IL-4, IL-10, TGF-β. L-NAT pretreatment reduced chemotactic activities i.e., SDF-1/CXCR4/CXCR12, FLT-3, and increased GCSF expression plays significant role in migration and proliferation of neuronal stem cells under gamma radiation stress. Therefore, NK1R antagonist could be a possible strategy to inhibit radiation induced substance-P mediated inflammation and subsequent cellular proliferation to achieve radioprotection cells.

Key Points
Inflammation, Substance-P, NK-1R, Ionizing radiation, Cytokines, Radioprotection.

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Design, Synthesis and Anti-inflammatory Activity of Pyrimidine Derivatives

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Abstract

Systemic inflammation, is triggered by microbial infection the result of release of the pro-inflammatory cytokines from immune-related cells and the chronic activation of the innate immune system and often leads to impaired function of the lungs, kidneys or other vital organs and leads to death. Despite recent advances in the approaches to cure condition of inflammation, there are still problems in managing patients with this condition. A novel series of pyrimidine derivatives were designed, synthesized and characterized via different techniques like H1 NMR, C13 NMR and mass spectrometry. Docking and scoring were used for design inflammatory inhibitors and show their binding affinity with active site key residues of receptor. The different new pyrimidine derivatives were synthesized via Petasis reaction. Physical parameters such as Rf values, LogP values, Mpts were also determined and purification of compounds was performed using Column chromatography. All the synthesized compounds were evaluated for their drug like properties using Lipinski's rule of five and also the pharmacokinetics studies were performed. The elucidated synthesized target compounds can be subjected to the biological evaluation as anti-inflammatory candidates because such scaffold have been reported as therapeutically important anti-inflammatory agent.

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Identification of Early Stage of Breast Cancer by Deep Learning System (DLS)

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Abstract
In our present study we have developed new magnification scale determining extra resolution to understand the affection inside and outside the cell membrane. This study was done on affected volunteers with the help of Clinical research organization. We developed a new DLS for each biomarker (ER, PR, and HER2) to enhance the possibility that different morphological features might be associated with each biomarker. Present study was performed in two stages in which Inception-V3 architecture concept was implemented, and image patches was cropped from the whole slide image. Each input image patch was of size 256 × 256 pixels at 10X magnification (512 µm wide at 2 µm/pixel). The patches were used for model development of sampled across the complete training set without any enrichment for morphological features or histologic subtypes. The developed model was further categorized into three categories i.e. biomarker positive invasive carcinoma, biomarker negative invasive carcinoma, and "Non-tumor" (i.e., not invasive carcinoma).

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Formulation and Evaluation of Oral Nanosuspension of Antipsychotic Drug

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Abstract
The objective of the present study was to formulate and evaluate oral nanosuspension of Quetiapine to deliver the drug orally for the treatment of Schizophrenia and other mental and bipolar disorders. The oral nanosuspension of Quetiapine was prepared using precipitation method containing Pluronic F127 as stabilizer and Tween 20 as surfactant. Total 9 batches were formulated as per 32 factorial design applied to check the effect of Pluronic F127 and Tween 20 on particle size and zeta potential. These formulations were evaluated for particle size and zeta potential. The batch F7 shows particle size 92.12 dnm, zeta potential -25.1 mv and increase in saturation solubility of formulation was found to be 133.45% and hence it was selected as the optimized batch. The optimized batch F7 provide good results of all evaluation parameters. Stability studies of the optimized formulation indicates no significant differences in particle size and zeta potential after a period of 1 month. Formulation F7 can provide good results in terms of particle size, zeta potential, drug content, saturation solubility, in vitro drug release and stability studies.

Key words
Quetiapine, Pluronic F 127, Tween 20, Ethanol and Water

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Phytochemical Estimation and In-vitro Anti Diabetic Activity of Some Herbal Plants


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Abstract

Diabetes mellitus is a metabolic disorder which may lead to chronic hyperglycemia accomplish with disturbances of carbohydrate, fat and protein metabolism resulting from defects in Insulin secretion (Type-I), Insulin Action (Type- II), or both. As per traditional Indian system of medicines , the combination of herbal drugs is more preferable which enhances the desired pharmacological activities and considered to be less toxic and free from undesirable side effects other than synthetic ones. It's a need to develop cost effective and safe antidiabetic drug. In this present study phytochemical evaluation of ethanolic extracts of Trigonella foenum-graecum and Musa paridiaca were performed , spectral analysis on both extracts was performed by TLC, UV and IR analysis. In virto α- amylase inhibition assay on extract were also studied. Results shows the presence of trigonelline, saponins, amino acids and polysaccharides in extract of Trigonella foenum-graecum and presence of flavonoids in extract of Musa paridiaca. Concentration of trigonelline in Trigonella foenum-graecum and total flavonoid content of Musa paridiaca were also determined. In virto α- amylase inhibition assay on extracts shows synergistic antidiabetic effect.

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Synthesis of Pyrazoline Analogues for Antimalarial Activity

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Abstract
The debilitating disease known as malaria, which is brought on by several parasites belonging to the genus Plasmodium, claims the lives of over one million people every year all over the world. There have been numerous attempts made to eradicate the sickness, but it has developed resistance to every single one of those approaches. As a direct consequence of this, the investigation into potential malaria treatments is a continuing process. In this respect, pyrazoline demonstrates promise as a useful heterocyclic compound. The most up-to-date method for treating malaria is referred to as "Hybrid Technology". Through the use of covalent bonds, molecules of varying sorts are brought together through this process. Taking into account the significance of pyrazoline from a pharmacological standpoint, it was decided to combine it with other bioactive properties under the presumption that the combination of these features within a single molecular framework would result in molecules with a significantly increased capacity for biological activity.

Keywords
Malaria, Plasmodium Parasite, Pyrazoline, Heterocyclic.

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Synthesis of Ferric(III) Hexacyanoferrate(II) and Influenceof Various Synthetic Parameters on Maximum Binding Capacity for Thallium

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Abstract
A well-known antidote to cesium and thallium, Ferric(III) Hexacyanoferrate(II) is known as Prussian Blue Insoluble (PB). PB, an active pharmaceutical ingredient (APIs) is considered to be an important part of formulations and needs to be obtained by standard methods with good Maximum Binding Capacity (MBC) for Thallium/Cesium. It is very difficult in many areas of the world including the developed countries to access the therapeutic-grade PB. The objectives of the present study was to synthesis PB and study the influence of various synthesis parameters on MBC and moisture content.The PB was synthesized by indirect method. Various synthesis parameters of indirect method of synthesis such as the concentration of oxidizing agent (10-30 ml), aging time (2-4 hrs.) drying time (2-4 hrs.), and drying temperature (60-80ºC), were varied to synthesize different batches of PB and each batch was analyzed for moisture content by thermo-gravimetric method and MBC for Tl by atomic absorption spectrometer.
The MBC of different batches of PB synthesized by indirect method was found to be in range of 112-200 mg/g and 16-34% moisture content. As per USFDA, the minimum MBC of PB for Thallium/Cesium should be 150 mg/g to qualify PB as therapeutically active antidote. The several batches of PB fail to achieve minimum USFDA specification. Drying time, volume of oxidizing agent and aging time significantly affected the MBC of PB. The optimized synthetic parameters meeting the specifications were aging time- 2 hrs, ageing temperature 60ºC, Concentration of oxidizing agent 20 ml, drying temperature 80ºC and drying time 2-2.5 hrs.

Keywords
Thallium; PB insoluble; Active pharmaceutical ingredients; Synthesis parameters; TGA; Atomic absorption spectrophotometer

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In vitro assay of alpha amylase and alpha glucosidas inhibitory activity of phytosomes of gymnemic acid isolated from Gymnema Sylvestre leaves

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Abstract

Diabetes mellitus is a complicated metabolic disorder. Type 1 and major type 2 are two types of diabetes out of which type 2 is accounting for 90% of cases international . The blood glucose level management is a crucial strategy in diabetes mellitus complications. Many various therapeutic techniques are available in the management of type II diabetes. Estimation of carbohydrate hydrolyzing enzymes inhibition ,includes α-amylase and alpha glucosidase could be an accurate strategy to test lowering of postprandial blood glucose levels. Artificial inhibitors which are present in scientific practice for control of diabetes are hanged with multiple gastrointestinal and other physiological problems. Consequently assessment of natural inhibitors with true bioavailability and lesser side effect is today's need . From literature survey I have selected gymnemic acid extracted from Gymnema sylvestre leaves and catechin mixture from Camellia sinensis phytosomal formulation is used to test for inhibitory effect on α-amylase and alpha glucosidase . These plants are widely used as traditional therapy for distinctive purposes . Major problems related to Gymnemic acid (GA), and other polyphenols like catechin mixture is poor bioavailability , poor water solubility and large structures, restrict permeation across biological membrane by means of oral route. GA phytosomes have shown outstanding bioavailability proved in literature survey . The IC50 value of Gymnemic acid and Catechin mixture phytosomal herbal formulation the new NDDS formulation had shown excellent in vitro antidiabetic activity comparable with Acarabos i.e 83.30µg/ml for alpha glucosidase 52.2 µg/ml for alpha amylase of Acarbose and 79.34µg/ml alpha glucosidase , 66.20 µg/ml for alpha amylase of phytosomal herbal

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Dissolution Profile Comparison: Divergent Expectations among Regulatory Agencies

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Abstract
Bio waiver approach for lower strength of dosage form in case of bioequivalence studies can be possible based on valid dissolution profile comparison. For F2 comparison all regulatory agencies have almost similar expectations, however when F2 statistics is not eligible due to high unit to unit variation, other statistical methods can be accepted by agencies like bootstrap F2 , multivariate confidence region using Multivariate Statistical Distance (MSD) or other model dependent approaches e.g., Weibull model. International agencies still have different guideline and conditions on dissolution similarities. This divergent approach on dissolution comparison by various agencies leads to overburden on analysis, regulatory reviews, delay in approvals with repeated queries. The purpose of this compilation is to compare regulatory requirements country wise on dissolution similarities and provide systematic approach to proceed for dissolution comparison experiments with case studies. Our aim is also to provide review on combination of approaches to scientifically justified dissolution similarities experiments to help industry to decide the approaches for submitting dissolution similarity experiments and response in case of queries from agencies which help to un-necessary bioequivalence studies on lower strengths or market extension products.

Key Words
Comparative dissolution, Bootstrap F2, modelling and non-modelling approaches, MSD

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Formulation and Evaluation of Famotidine Gastroretantive Floating Tablet by Using Biopolymer

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Abstract

HPMC K4M, HPMC K15M, and HPMC K100M polymers are used in this study to make floating tablets of famotidine hydrochloride (HCl). Drug delivery systems that are floating in the stomach have a lower bulk density than gastric fluids, therefore they stay buoyant in the stomach for a lengthy period of time without impacting gastric emptying rate. In the treatment of Gastroesophageal Reflux Disease (GERD) and Peptic Ulcer Disease (PUD), famotidine is a histamine H2 receptor antagonist (GERD). Famotidine is an excellent option for a floating drug delivery system because of its short half-life, brief time in the stomach, and repeated doses. Melt-granulation technique was used to make famotidine floating tablets using HPMC K4M, HPMC K15M, and HPMC K100M. In vitro buoyancy, drug polymer compatibility (IR research), weight fluctuation, hardness, friability, thickness, drug content, and invitro dissolution experiments were all performed on the floating tablets. Using in vitro buoyancy and dissolvability experiments, we were able to establish that the micromeritic characteristics were excellent. HPMC K100M-based formulation F4 has an excellent in vitro buoyancy lag time and floating time, and in vitro dissolution investigations demonstrate a 96.78 percent release for 12 hours. As a result of the findings of this research, it can be concluded that famotidine floating tablets provide the potential for longer-term drug delivery and a consequent reduction in dosage frequency.

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Design and Development of Pullulan Based Biopolymeric Microporous Scaffolds for Pre-Hospital Management of Combat Related Burn Wounds

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Abstract

Present study was designed to prepare two types of microporous bioactive scaffolds fabricated from pullulan-gelatin or pullulan-chitosan, and impregnated with peppermint (PEO) oil (Pu/Gel/PEO & Pu/Ch/PEO). The fabricated scaffolds were evaluated for their efficacy in healing of second degree partial-thickness burn wounds. Scaffolds were characterized by scanning electron microscopy (SEM), FTIR, themogravimetric analysis and differential scanning calorimetry. Swelling index, in-vitro biodegradation and hemolytic index (HI) of prepared scaffolds were also assessed. In-vivo efficacy evaluation was carried out in rats inflicted with second degree burn to assess wound retraction. Histology, immunohistochemistry (IHC), gram and picrosirius staining (PSRs) studies were also performed. SEM results indicated that pore size of Pu/Gel/PEO and Pu/Ch/PEO scaffolds was in the range of 37.2-234µm and 35.5-228µm respectively. HI was in range of 0.3-2.9, indicating non-hemolytic nature of scaffolds. Wound retraction in rats showed that Pu/Gel/PEO scaffolds accelerated dermal regeneration faster in comparison to Pu/Ch/PEO scaffolds. IHC results demonstrated enhanced expression level of epidermal growth factor and fibroblast growth factor-2 in Pu/Gel/PEO scaffold-treated groups. PSRs also showed enhanced collagen deposition in Pu/Gel/PEO scaffold-treated group. Collectively, our findings indicate that biopolymeric scaffolds made from pullulan in combination with gelatin and PEO may serve as promising substrate for skin regeneration.

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Comparative Study of Herbal Plants Used In Thrombosis with their adjunct effects

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Abstract

Verity of ethno medicinal plant with several medicinal properties is used widely in ancient medicinal system to treat a variety of disorders including blood related causes. The plants used for comparative studies are reported to cause variations in clotting time; this is mainly due to disruption of the coagulation cascade and to have antithrombin property. Most common reason of death in vessel disease is thrombosis. Investigations are being carried out with novel antithrombotics due to thromboembolic disorders with minimum side & adverse effects in which herbs are considered as alternative remedies. An ancient remedy has developed their own theories for dose preparation. However, still herbal medicines have a limitation in its function and efficacy. The plants are reported in literature to have antithrombin activity. Herewith are discussed about comparative studies of Lantana camara with few herbal medicinal plants used in thrombosis. The main objective of study is comparison of antithrombin activity of crude extract of herbal plants and their adjunct effects. In this, we focused on our current understanding of the regulatory mechanisms of ancient medicinal plants in thrombosis. Thus, it is required to study the effect of ancient herbs as alternative therapeutics. Among the proposed plants Lantana camara, Boswelliaserrata, Matricariachamomilla, Rosmarinus officinalis, Allium sativum Sesamumindicum, and Carthamustinctorius are the most researched plants in modern antithrombotic studies while some plants such as Ginkgo biloba, Zingiberofficinale, Paullina ulmariaetc helps to prevent the clot formation. Extraction was done using standard extraction process by using Soxhlet apparatus and different solvents based on their polarity. The Antithrombin activity was evaluated by chromogenic assay. The study was performed on rabbits with prior approval from AIEC. All herbal plants taken for study have shown the antithrombin activity. In the comparative study, Lantana camara has shown less or more antithrombin activity than other herbal plants.

Keyword

Herbal plant, Antithrombin, Lantana camara, Chromogenic assay.

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Gene Therapy: Applications in Neuro Degenerative Disorders

(Parkinson's disease and Alzheimer's disease)

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Abstract

Gene therapy typically involves the insertion of a functioning gene into cells to correct a cellular dysfunction or to provide a new cellular function. Increasing knowledge about culture and transplantation techniques has led to realization that gene therapy not only applies to genetic diseases but also to many neuro degerative disorders in the central nervous system. We will discuss applications of gene therapy in Parkinson's and Alzheimer's disease and also the most commonly used tools for the delivery of genetic materials in the central nervous system.

Keywords

gene therapy, neuro degenerative disorders, genetic material, genetic tools

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Preliminary Phytochemical Screening and Anti-Anaemic Activity of Haldina Cordifolia Bark

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Abstract
Haldu i.e; Haldina cordifolia which is native to Southern China, India, Sri-Lanka and Vietnam belongs to the family Rubiaceae. Traditionally, it has been used in the various ailments such as; bark paste applied on the bacterial infections, eczema & scabies, bark decoction is given to the pregnant woman to prevent their miscarriages, anemia and fever etc.
After extensive literature survey of Haldina cordifolia, it was observed that Anti-Anaemic activity of Haldina cordifolia bark was not reported till date. Therefore, present study was aimed for preliminary identification of phytoconstituents and anti-anaemic activity of Haldina cordifolia bark extracts. Soxhlet extraction method was used for the preparation of different extracts according to polarity such as petroleum ether, chloroform, ethanol and water. Preliminary phytochemical tests were performed and TLC fingerprinting was performed for further confirmation. Further anti-anaemic activity of bark extracts of Haldina cordifolia was performed to validate the traditional claim. Preliminary phytochemical screening revealed the presence of glycosides, tannins, flavonoids, carbohydrates etc. were present. In anti-anemic activity ethanol extract was found potent among all other extracts. This extract can be further used for the isolation of active constituents and further formulation will be prepared in future.

Keywords
Anemic, Haldina cordifolia, Extraction, Preliminary phytochemical screening.

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A Review on Pharmacological Activity and Traditional Uses of Grewia Optiva

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Abstract
Plant based dietary supplements are slowly replacing the synthetic medications in recent times. About 150 species of Grewia has been reported till date, among them Grewia optiva a traditionally used medicinal plant belonging to family Tiliaceae is widely distributed in India and other asian subcontinent. From ancient times it has been used as a treatment of various diseases like, inflammation, dysentery, fever, typhoid, diarrhoea, eczema, smallpox, malaria, cough. Recent studies suggest that G. optiva is a rich source of triterpenoids and flavonoids, which are responsible for its strong anti-oxidant property. Presence of alkaloids, glycosides, tannins, steroids and saponins is accountable for pharmacological activities; anticholinesterase, antilipidemic, antinociceptive, hepatoprotective, antidiabetic, antimicrobial, antimalarial, and sedative–hypnotic s azheimer.

Keywords
Grewia optiva, Pharmacological activity, Traditional uses.

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Evaluation of Hydro-Alcoholic Extract of G. Asiatica Leaves on Aluminium Chloride Induced Neurotoxicity in Rats

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Abstract
Human body is under control of millions neurons those are emerged from and jumbled into the brain, the most complex structure of our body. Neurotoxicity is a measure of microglial cell activation and generation of Reactive Oxygen Species (ROS) frequently associated with several neurodegenerative disorders. Aluminum chloride accumulates in specific brain regions; induces oxidative stress, disrupts calcium homeostasis, decreases cholinergic functions and causes DNA damage in neuronal cells. Hydro-alcoholic leaves extract of Grewia asiatica, a traditionally active plant belongs to the family Tiliaceae; scientifically accepted to possess anti-oxidant, anti-inflammatory and cytotoxic effect. Aim of the study was to evaluate hydro-alcoholic extract of G. asiatica leaves on aluminium chloride induced neurotoxicity in rats. Aluminium chloride (100mg/kg b. wt) administration for 14 days shows decrease in the level of anti-oxidant enzymes; increase in AchE, calcium and LDH level. Among all treatment groups, highest dose (500mg/kg b. wt, p.o.) of hydro-alcoholic extract of G. asiatica leaves significantly improves the level of anti-oxidant enzymes SOD, GSH, Catalase level and decrease the level of LDH, MDA, calcium, AchE as compare to the positive control group. This study concludes that hydro-alcoholic extract of G. asiatica leaves has a protective effect against aluminium chloride induced neurotoxicity.

Keywords
AchE, Calcium, G. asiatica, MDA, Neurotoxicity.

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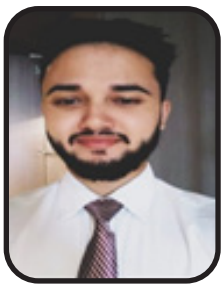
Ethnopharmacological Evaluation of Cornus Capitata Wall Ex. Roxb. Leaf and Stem Extracts on Stz Induced Type II Diabetes Mellitus in Rats



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Abstract
Diabetes Mellitus is a set of illnesses defined by high blood glucose levels caused by absolute insulin insufficiency. Cornus species have a high concentration of triterpenoids, flavonoids, ellagic acids, polyphenolic acids. As a result, the anti-diabetic effect of methanolic extract of Cornus capitata leaves and ethanolic extract of Cornus capitata stems was investigated in this study. Fructose (10%w/v) in drinking water was given for period of 14 days followed by single dose of STZ (40mg/kg). Animals having body weight of 270g, and fasting blood sugar level of 200mg/dl were considered as diabetic rats and were selected for the study. The diabetic rats were divided into eight groups, each group containing six animals. The diabetic rats received methanolic extract of leaf and ethanolic extract of stem at dose levels of 100, 200, 400mg/kg for a period of 21 days. Higher dose level of leaf and stem extracts improved the histology of pancreatic β cell and hepatic cell. Results of the present study concludes that methanolic extract of leaf caused significant improvement in the abnormalities of diabetic complication and can be explored as potential treatment strategy for the management of diabetes.

Keywords
Diabetes Mellitus, Cornus Capitata, STZ , Diabetic Complication.

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A Questionnaire-Based Study of Student's Opinion on the Teaching and Learning Methods in Pharmacology of Undergraduate Students in Various Pharmacy Colleges of West Bengal, India

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Abstract
Pharmacology is the branch of biology dealing with the study of drug action. Understanding current perceptions of pharmacy students regarding learning pharmacology and understanding pharmacology's role in both clinical practice and research may be helpful in improving the method of teaching. The aim of this study was to evaluate pharmacy students' opinions toward pharmacology. The study was conducted using a pre-validated questionnaire that was based on the widely recognized "Likert Scale". The main objective of this study was to explore the most effective learning process of pharmacology at bachelor's labels in multiple pharmaceutical colleges of West Bengal in India. 3rd year and 4th year B. pharmacy students were selected for this survey. This was a questionnaire-based descriptive cross-sectional study. The study was organized and carried out by the Department of Pharmacology, Bengal School of Technology, West Bengal. Out of the 300 students who answered, 58.33% of students considered pharmacology is their favorite subject in the basic sciences. Audio-visual aided lectures were judged the most beneficial by 37.33% of students, while interactive lectures were rated by 26%. The result of this study revealed positive feedback from students which will help in making the teaching program in pharmacology more interesting and relevant.

Key Words
Audio-visual aided lectures, Interactive, Likert scale, Pharmacology.

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Traditionally Used Kadha – A Phytochemical and Pharmacological Review

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Abstract

Kadha is an Ayurvedic drink made from herbs and spices that has been boiled in water to extract the medicinal properties of the ingredients. It can be made with a variety of ingredient combinations. The most popular ingredients used to make kadhas are basil, cinnamon, clove, lemon, ginger, and honey. Tulsi, ginger, honey, lemon, cinnamon, and cloves are some of the traditional herbs used in this immunity boosting kadha recipe. Although some people are born with a strong immune system, others are turning to natural remedies to improve their endurance, immune system, and overall health. Many of us are doing yoga, breathing exercises, and other natural remedies such as herbal teas, drinks, and kadhas on a daily basis. When it comes to kadha, it is not an exaggeration to say that it is one of India's oldest and most cherished medicinal secrets. It's a blend of traditional herbs and spices that help us stay strong from the inside out.

Keywords

Phytochemicals, kadha, immunity booster, natural remedies

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Evaluation of Hepatoprotective Activity of Polyherbal Formulation Against CCL_4 Induced Hepatic Damage in Rats

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Abstract
Liver is the vital organ play a major role in metabolism and excretion of xenobiotics from the body. Liver cell injury caused by various toxic chemicals (antibiotics, CCL4, thioacetamide, chemotherapeutic agents). The available synthetic drugs to treat liver disorders in this condition cause further damage to the liver. Nowadays, herbal medications have become increasingly popular. In Indian medicinal system the Polyherbal formulation has been traditionally used as a chief formulation for the treatment of hepatic diseases. Plants such as Ageratum conzoides, Aegle maemelos, Tinospora cordifolia have hepatoprotective activity. This study is focused to prepare polyherbal formulation of these three ethanolic extracts by mixing them in different ratio. The aim of the study was to evaluate hepatoprotective activity of polyherbal formulation against CCL4 induced hepatic damage in rats. Hepatotoxicity was induced by administration of CCL4 1mg/kg (50% CCL4 in olive oil). The Liv-52 (1ml/kg) was used as standard. CCL4 mainly act by the generation of free radicals and increases the lipid peroxidation disturbing membrane integrity. The result conclude that the polyherbal formulation 1 at the dose of 500mg/kg and polyherbal formulation 2 at dose of 250mg/kg shows good hepatoprotective activity by lowering the levels of SGOT, SGPT, alkaline phosphatase, bilirubin.

Keywords
Alkaline phosphatase, Bilirubin, Carbontetrachloride, Polyherbal formulation, Xenobiotics

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To Evaluate the Antidiabetic Potential of an Allopolyherbal Formulations on Streptozotocin Induced Diabetic Rats

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Abstract
Diabetes mellitus is a hormonal imbalance. The estimated data shows that more than 200 million people World Wide will have diabetes mellitus and more than 300 million will subsequently have the disease by year 2025. It is characterized by hyperglycemia and alteration in fat, carbohydrates and protein metabolism. The aim of the study was to evaluate antidiabetic potential of the allopolyherbal formulations and compare with the standard drug (metformin) and positive (diabetic) group. The diabetes induced by streptozotocin 65mg/kg in 0.1M citrate buffer pH 4.5. After the induction of diabetes treatment groups served with the allopolyherbal formulations, APHF-A, APHF-B and APHF-C (Polyherbal:Metformin) 50:50, 60:40 and 80:20 respectively for 21 days. The glucose level and the body weight of the groups were recorded on 0, 7th, 14th and 21th day. The result concluded that body weight of the group treated with APHF-A produce more significant result. Group treated with metformin reduces body weight, APHF-B and APHF-C increases body weight. APHF-A showed maximum effectiveness in decreasing blood glucose level in the diabetic rats and proved to have a better glucose lowering effect than Metformin, APHF-B and APHF-C formulations. SGOT, SGPT, bilirubin, BUN, Creatinine, LPO, SOD and reduced glutathione parameters were recorded.

Keywords
Allopolyherbal formulation, Endocrine disorder, Hyperglycemia, Metformin, Streptozotocin

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Neuro-Pharmacological Activity of Ethanoloic Extract of Elephantopus Scaber Linn Leaves

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Abstarct

Elephantopus scaber Linn. family Asteraceae, is a small herb found in Neotropics, Europe, Asia, Africa and Australia. This herb has been used traditionally for the treatment of a number of diseases in many countries. Sesquiterpene lactones, triterpenoids, steroids, flavonoids and essential oil constituents have been reported from various parts of the plant. In the current work, antiepileptic and anti-anxiety activities of ethanolic extract of Elephantopus scaber (EtES) leaves were observed in rat models. The Extensor/Flexion ratio was used as the end point in the MES model to assess the antiepileptic potential of drugs in generalised tonic-clonic seizures. EtES considerably delayed the onset of PTZ-induced convulsions in a dose-dependent manner compared to the control group, and the duration of the jerk was significantly reduced in the treatment groups. At dosages of 200 and 300 mg/kg BW of EtES, no clonus was detected, and the animals were recovered. These findings suggest that EtES was very efficient in treating PTZ-induced seizures. The effect of a drug on animals with PTZ-induced epilepsy can be used to estimate its impact on a generalised absence seizure. PTZ is a GABAA receptor antagonist, whereas diazepam (benzodiazepines) is a GABA facilitator. EtES 's anticonvulsant effect is thought to be mediated through the GABA-chloride channel.

The EPM test was founded on the dread of balancing on a narrow space and the aversion to unexpected open space. As a result, avoiding open arms is regarded as an anxiety-inducing activity. Angiolytic medicines include drugs like diazepam, which lengthen the time and number of entry in the open arms. The findings of the EPM test revealed that EtES -treated groups had less entries in both the near and open arms, possibly due to the extract's depressive impact. The time spent in open arm in EtES -treated groups was not substantially different from the control group, but diazepam-treated groups spent greater time in open arm. According to these findings, EtES leave had less effect on anxiety.

Key words

Elephantopus scaber Linn, Antiepileptic and Anti-anxiety, Diazepam

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Evaluation of Antidiabetic Effect of Combination of Onion and Garlic Juice on STZ Induced Diabetic Rats

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Abstract
In diabetic conditions, the main root cause is the elevated blood glucose level due to the decreased level of insulin. Many herbal drugs are frequently used as a remedy for the array of human disorders followed in diabetes mellitus which includes diabetes retinopathy, nephropathy, neuropathy, diabetic foot disease. Many folk medicines are used to treat the disrupted beta cells of islets of langerhans. Allium cepa and Allium sativum have been previously used to treat the symptoms produced by diabetes like elevated glucose levels. The phytochemical tests of Allium cepa and Allium sativum were performed. The present study was aimed to the evaluation of the anti diabetic effect of combination of onion and garlic juice on streptozotocin induced diabetic rats. The reduction in the blood glucose level was found. Diabetes is associated with weight loss; the treatment presented a significant increase along with increase in the antioxidant level which lowered the free radical production in the diabetic condition. The hepatic transaminase level also decreased after treatment.

Keywords
Allium cepa, Allium sativum, Diabetes, Streptozotocin, Transaminase level.

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Modulatory Effect of Age Inhibitor Pyridoxamine on Diabetic Complication in Streptozotocin-Induced Diabetes in Rat

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Abstract
Diabetes mellitus is a group of metabolic disorders characterized by hyperglycemic condition with elevated blood glucose levels. Pyridoxamine is cofactor that functions as antioxidant preventing the development of Advanced Glycation End-Products (AGEs). Aim of the present study is to investigate the modulatory effect of AGE inhibitor pyridoxamine on diabetic complication in streptozotocin-induced diabetic rats. Diabetes was induced in rats by i.p injection of a single dose of Streptozotocin (65 mg/kg). After 72hrs blood was taken from the animals, serum was separated out and fasting serum glucose level was estimated in the animals by glucose oxidase peroxidase method. Animals showing FSG levels above 250 mg/dl were considered as diabetic. Diabetic animals were treated with pyridoxamine at different dose level for 30 days. After 30 days, animals subjected to behavioral studies to evaluate the effect of pyridoxamine on diabetic neuropathy. Biochemical parameter was estimated from blood serum (Glycosylated haemoglobin, SGOT, SGPT, Urea, Uric acid, Creatinine, and Nitrate) along with the oxidative stress parameter (LPO SOD, GSH). Treatment of diabetic animal with pyridoxamine caused decrease the biochemical parameter, SOD, LPO while increase GSH level in STZ-induced diabetic. It concluded that pyridoxamine as AGE inhibitor can considered as treatment strategy for diabetes-induced complications.

Keywords
Advanced glycation end product, oxidative stress, Pyridoxamine

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A Review on Drug-Drug Interaction of Macrolides

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Abstract
Macrolide antibiotics are the most widely prescribed class of antibiotics and include natural members, prodrugs, and semisynthetic derivatives. They are frequently co-prescribed with other drugs for treatment and management of various diseases. The rapid expansion and thorough clinical usage of the macrolide antibiotic family in recent years have increased the risk of drug interactions between them and other pharmacologically active drugs. We studied the interaction between the macrolides and five other classes of drugs namely, theophylline, cyclosporine, terfenadine, warfarin, and calcium channel blockers. Macrolides interfere with the metabolism of these drugs by impeding their common route of metabolism i.e, cytochrome P450 isoforms. The presence of an accessible N (CH3h group in the molecule, steric hindrance surrounding this group, and the hydrophobicity of the molecules, which is directly proportionate to their potency as metabolite-complex precursors, all contribute to the formation of a cytochrome P450/ nitroso alkane complex. This interaction is a potential factor impacting the complex biotransformation and leading to the changes in the pharmacokinetic profile of these drugs. Macrolides can impede drug metabolism in the liver by forming complexes and inactivating microsomal drug oxidizing enzymes, as well as by interfering with microorganisms of the enteric flora through their antibiotic actions.

Key Words
Macrolide, Antibiotics, Interaction, Metabolism, Cytochrome P450

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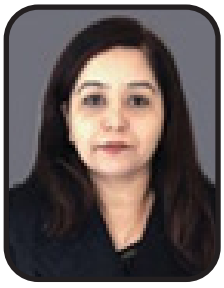
High Fat Diet Induced Diabetic Osteoporosis in C57BL/6 Mice is Alleviated with the Combination of Linagliptin and Metformin

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Abstract

Background: Diabetic osteoporosis is a poorly managed serious skeletal complication, characterized by high fracture risk, increased bone resorption, reduced bone formation, and disrupted bone architecture. There is a need to investigate drugs that can improve bone health along with managing glycemic control. DPP-4 inhibitors and metformin have proven benefits in improving bone health. Here, we investigated the effects of linagliptin, a DPP inhibitor, and metformin alone and in combination to treat diabetic osteoporosis in high-fat-fed mice.

Methods: C57BL/6 mice were kept on the High-Fat Diet (HFD) for 22 weeks to induce diabetic osteoporosis. Linagliptin (10mg/Kg), metformin (150mg/Kg), and their combination were orally administered to the diabetic mice from the 18th-22nd week. Femur bone microarchitecture together with bone mineral density (BMD) were evaluated using µCT. Further, bone turnover biomarkers namely bone morphogenetic protein-2 (BMP-2), sclerostin, tartrate-resistant acid phosphatase (TRAP), osteocalcin, alkaline phosphatase (ALP) and calcium were assessed. Additionally, metabolic parameters including body weight, Fasting Blood Glucose (FBG), glucose & insulin tolerance, and leptin were measured.

Results: HFD feeding resulted in impaired bone microarchitecture, reduced BMD, distorted bone histology, and altered bone turnover biomarkers as indicated by the significant reduction in bone ALP, BMP-2, osteocalcin, and an increase in sclerostin, TRAP, and serum calcium. Interestingly, treatment with linagliptin and its combination with metformin significantly reverted the impaired bone architecture, BMD, and positively modulated bone turnover biomarkers, while metformin alone did not exhibit any significant improvement. Further, HFD induced diabetes and metabolic abnormalities (including an increase in body weight, FBG, impaired glucose and insulin tolerance, and leptin were successfully reversed by treatment with linagliptin, metformin, and their combination.

Conclusion: Linagliptin and its combination with metformin successfully ameliorated diabetic osteoporosis in HFD-fed mice possibly through modulation of BMP-2 and sclerostin. The study provides the first evidence for the possible use of linagliptin and metformin combination for managing diabetic osteoporosis.

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Pharmacological Screening and Comparative Assessment of the Effect of Heme Oxygenase-1 Inducers for Nephroprotective Effect in Gentamicin Induced Nephrotoxicity in Rats

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Abstract
Heme Oxygenase-1 (HO-1) is a member of heat shock family of proteins and inducers of HO-1 are reported to have nephroprotective, gastroprotective and neuroprotective activities. Therefore present work was aimed to screen and compare the effect of HO-1 inducer (Trans-Chalcone and Fluvastatin) for their nephroprotective effect in Gentamicin induced nephrotoxicity in rats. Animals received Trans-Chalcone at a dose of 10, 20 and 40 mg/kg i.p. and Fluvastatin at a dose of 10, 20 and 40 mg/kg p.o. along with Gentamicin (100 mg/kg p.o.) for a period of 21 days. Trans-Chalcone treatment at a dose of (10, 20 and 40 mg/kg) showed a significant decrease ($P<0.001$) in serum creatinine, urea, uric acid and significant increase ($P<0.001$) in GSH, SOD, total protein, and albumin levels in nephrotoxic rats. Fluvastatin treatment at a dose of (10, 20 and 40 mg/kg) showed significant decrease in serum creatinine, urea, uric acid ($P<0.001$) and significant increase ($P<0.001$) in GSH, SOD, total protein and albumin levels. Results of histopathology of kidney indicated improvement in morphology of kidney cells. The results of present study conclude that Trans-Chalcone and Fluvastatin possess significant potential to induce the expression of HO-1 and can be explored as treatment strategy for nephrotoxicity.

Keywords
Fluvastatin, Heme oxygenase 1, Nephroprotective, Nephrotoxicity, Trans-chalcone

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Evaluation of Neuroprotective Effect of S.Cumini Seed Extract on Ciprofloxacin Induced CNS Disorders in Rats

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Abstract

The changes in the neurotransmitters or oxidative stress in the brain are associated with several illnesses. Some antibiotics like ciprofloxacin wich is used in the current study, affect the neurological health by causing imbalance in the GABAergic/glutamergic balance as well as rise in oxidative stress. The previous studies done on S.cumini seed extract shows its invitro antioxidant scavenging activity. The purpose of this study is the evaluation of neuroprotective effect of S.cumini seed extract on ciprofloxacin induced CNS disorders in rats. The animals were divided into 6 groups each of five rats, all animals were administered ciprofloxacin 100mg/kg p.o for a period of 15 days ,except for the normal control group. The standard group received 10mg/kg p.o dextromethorphan while the treatment groups received 150, 300, 600 mg/kg p.o of methanolic S.cumini seed extract for the treatment groups 1,2,3 respectively for a period of 15 days. The treatment groups illustrated a significant decrease in gait score index and narrow beam test for behavioral test as well as significant decrease in oxidative stress LPO and AchE which indicate behavioral recovery, higher antioxidant defense and restoration of acetylcholine activity in the synaptic cleft respectively. Elevated levels of GHS and SOD in the treatment groups indicates recovery and restoration in the antioxidant enzymes in the brain. Histopathology repot illustrated recovery of inflammation and gliosis in treatment groups as compared to the toxicant group (only ciprofloxacin). Results of the study concluded, it is evident that methanolic seed extract of S.cumini protects against ciprofloxacin mediated alterations in neurotransmitters and oxidative stress markers.

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Effect of Both Analgesic & Anti- Inflammatory Activity of Butea Frondosa Linn Leaves on Swiss Albino Rat

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Abstract

Butea monosperma linn. (Palas) is found in topical as well as subtropical region of India, subcontinent and southern Asia, cross the Pakistan, Srilanka ,Myanmar, Bangladesh, Nepal, Thailand, Malaysia and many more. Butea monosperma linn. also known as Flame-of-forest, it belongs to the family fabaceae. Butea monosperma linn. is one of the crud drugs used with potential to treat a wide range of diseases and disorders. It is one of the most beautiful trees used in Ayurveda, Unani and homeopathy treatment and has become modern medicine cynosure. As a result, it has a significant position due to its medical and other drivers uses aa as economical value. Using continuous soxhlet extraction apparatus Water, alcohol and petroleum ether extractions were extracted from Butea monosperma dried leaves. The extraction was evaporated to dryness by using rota evaporated and drying in the desiccator this dried extract was treated as whole drug and tested for in-vitro analgesic activity using Eddy hot plate method, Tail immersion method, Tail flick method and in-vitro anti-inflammation activity using Carrageenan induced paw edema method with Diclofenac sodium as standard drug. Animal research that demonstrated analgesic and anti inflammation in male wistar albino mice supported the success of the in-vitro study.

Keywords

Butea monosperma, Palas, Analgesic, Anti-inflammation, Soxhlet, Carrageenan, edema, In-vitro, Extraction.

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Modulatory Effect of Wheat Sprout Extract and Melatonin in Myocardial Reperfusion Injury in Rats

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Abstract
Wheat sprout (Triticum aestivum), Gramineae is used since ancient times for maintaining a good health and known to possess various biological activities due to presence of bioflavonoids in it. The purpose of this study was to evaluate the effect of wheat sprout extract and melatonin in myocardial reperfusion injury in rats. Male SD rats were divided into five groups (n=6). Animals received wheat sprout extract and melatonin (10 mg/kg, p.o.) and the combination of both (1:1) for 30 days. After 30 days, coronary artery ligation was carried out under pentobarbitone (10 mg/kg,i.p.) anaesthesia along with atropine (0.1mg/kg,i.p.) and myocardial injury was induced in rats. Treatment with wheat sprout extract and melatonin caused significant decrease (**P< 0.01) in the level of calcium, LDH, creatinine kinase, troponin (I and T), and SGOT in the heart of infarcted rats. Wheat sprouts and melatonin at a dose of 10 mg/kg caused significant improvement in oxidative stress. However, the combination produced much more significant results. Remarkable improvement in the histology of heart tissue was also observed in the treated groups. Results of the study concludes that the combination of wheat sprout extract and melatonin have the potential to protects heart from myocardial reperfusion injury.

Keywords
Coronary artery ligation, Myocardial infarction, Melatonin, Troponin, Wheat sprout.

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Assessment of Toxicity and Safety Margin of Phenylalanine and Its Metabolites through In Vivo & In Vitro Model of Zebrafish (Danio rerio)

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Abstract

Phenylalanine (PA), an emergent essential amino acid, building block of protein, propagates metabolites to assure the compatibility of the body. Derangement of metabolism of PA or genetic mutation, alters tyrosine synthesis, causes Phenylketonuria (PKU). Genetic similarities of Danio rerio with humans allow comparison of metabolic pathways in fish model. The objective of this study is to evaluate the toxicity and safety margin of Phenylalanine, and one of its metabolites, Sodium Phenylpyruvate (SPP). Toxicological assessment LC50 study (OECD TG 236), developmental toxicity study (total body length, head size, caudal fin length of embryo), and hepatoxicity study (SGPT, SGOT, Histopathology) has been performed on Danio rerio model. For phenylalanine, LC50 values are, 1949, 829, 213, 133, 92.68 µg/ml, for phenylpyruvate, LC50 values are, 224.9, 169.82, 105.15, 97.05, 79.79 µg/ml. For developmental study, PA (0.5 mg/ml, 0.75mg/ml, 1mg/ml) and SPP (0.25mg/ml, 0.40mg/ml, 0.60mg/ml) concentrations are considered. For hepatotoxicity study on adult zebrafish groups (n=6), treated with PA and SPP with concentrations of 10mg/kg, 20mg/kg, and 40mg/kg separately. After experiment, it is observed that for PA at its 1mg/ml dose showed significant difference for head length/width and vertical/longitudinal caudal fin length. For SPP, total body length and longitudinal caudal fin length showed significant different at 0.6 mg/ml dose. The SGPT-SGOT test results shows that SPP is more toxic than PA. Histopathological study of hepatocytes of Danio rerio shows more positive results for SPP treatment than PA Therefore, it can be concluded that a higher concentration of SPP can cause potential toxicity and health hazards.

Keywords

Danio rerio, Embryotoxicity, Phenylalanine, Phenylpyruvate, Hepatotoxicity, Histopathology, Developmental Toxicity, Amino Acids

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In Silico Molecular Mechanism of Flavonoid as a Cyclooxygenase-2 Inhibitor

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Abstract
Finding novel COX-2 inhibitors is a key component of the development of anti-inflammatory drugs. A flavonoid called quercetin has recently been identified as a novel COX-2 inhibitor. There hasn't been any work done up to this point to investigate in-depth mechanistic insights to comprehend its mechanism and binding manner. In the current study, molecular docking simulations were used to investigate the substance's mechanism of binding and its molecular interactions with the COX-2 enzyme's ligand binding site. Quercetin demonstrated a variety of molecular interactions with COX-2, particularly with Arg102, Tyr355, and Met252. The main attractive forces involved in macromolecular contacts were hydrogen bonds, dipole-dipole interactions, and hydrophobic interactions. Quercetin's molecular alterations are reviewed in relation to potential advancements in the ligand as a new lead chemical against the COX-2 enzyme.

Keywords
Quercetin, COX-2 enzyme, Docking, Anti-inflammation

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To Evaluate the Hepatoprotective Potential of Leaf Extract of Alnus Nepalensis on Hepatotoxic Models of Rat

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Abstract
In human body one of the large organs is liver which having an important role in regulating various physiological process in the body like metabolism and it also can detoxicate toxic substances like carbon tetrachloride. The use of synthetic drug as a treatment of a disease resulting another side effect in human physiology. Nowadays, plant-based drug like herbal medication replaces the demand of synthetic drug with better efficacy and less side effect. The aim of the study was to study hepatoprotective potential of leaf extract of Alnus nepalensis against CCl4, and Ethanol induced hepatic damage in rats. The hepatotoxicity was induced by administration of CCl4, (1 ml/kg) and Ethanol (2 ml/kg) to the rats. The levels of liver enzymes (SGOT, SGPT, GGT and Serum Bilirubin) levels were increased. The herbal extracts produced significant hepatoprotective activity. The ethanolic extracts at dose of 500 mg/kg and n-hexane extract at dose of 500 mg/kg show good hepatoprotective activity by lowering the levels of SGOT, SGPT GGT and Bilirubin. Oxidative parameter shows that both extracts have significantly hepatoprotective activity ($p<0.05$). The study demonstrates that leaf extract of Alnus nepalensis has a good hepatoprotective activity.

Keywords
Alnus nepalensis, Bilirubin, CCl4, GGT, SGOT, SGPT

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Pharmacological Evaluation of Methanolic Extract of Bidens Biternata (LOUR) Stem for Hematinic Activity in Rats

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Abstract
Anemia is a global public health issue worldwide, mainly in developing and underdeveloped countries and is characterized by decrease in blood oxygen carrying capacity in such an extent that does not attend demand of body cells. Bidens biternata (lour) is wide spread weed found in all over the world traditionally used for treating variety of ailments. The present study was conducted to evaluate the hematinic activity of methanolic extract of Bidens biternata stem in rats. Hematotoxicity was induced in rats by Phenylhydrazine (8mg/kg, p.o for 7 days). Animals were divided into 5 groups including one normal control group. Methanolic extract of stem were given at a dose of 100, 200 and 400 mg/kg to the anemic animals for a period of 14 days. Various parameters like body weight, RBCs, WBCs, hematocrit, haemoglobin level and prooxidant-antioxidant status was evaluated. Results revealed that methanolic extract caused dose dependent improvement in blood Hb level, antioxidant enzymes and decrease in the level of lipid peroxidation with most significant ($P<0.001$) effect at a dose of 200 mg/kg and 400mg/kg. Result concludes that methanolic extract of Bidens biternata stem can be used a substitute of diet to improve malnutrition in economically poor communities.

Keywords
Bidens biternate, Hematinic, Hemoglobin, Lipid peroxidation, Phenylhydrazine

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Effect of Anti-inflammatory Drugs in Alzheimer's Disease

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Abstract

Introduction: Alzheimer's Disease [AD] is a complex multifactorial neurodegenerative disorder. The pathophysiology of Alzheimer's disease is not very clear but it is considered to be inflammatory disorder followed by formation of altered proteins like ApoE2, ApoE4, Presenilin and amyloid precursor proteins. Dementia due to AD is the major cause in elders. CT Scan and MRI have typical results showing narrowing of gyri, widening of sulcus, widespread cortical atrophy, and enhanced atrophy in hippocampus. Although it is a continuous neurodegenerative disorder with no cure yet but considering the pathophysiology of inflammation involved, anti-inflammatory drugs that can cross blood brain barrier might prove effective in controlling the symptoms to some extent.

Methodology: Immune based biomarkers and imaging techniques to be used in initial stages to understand the target for the therapy. Anti-amyloid therapy, anti tau therapy, anti-inflammatory therapy is the three-drug therapy for the studies. Each therapy contains many drugs that has different target and working mechanism. The effectiveness of the drug therapy must be checked through imaging techniques with analyzing of brain structure changes and serum immune biomarkers.

Result: Anti-amyloid therapy: help in reduction of neurotoxicity. It works on three strategies mainly inhibiting the secretase, Abeta aggregation and immunotherapy of aggregated amyloid.

Anti tau therapy: hyperphosphorylated tau proteins lead to inflammation and neurotoxicity. Anti tau therapy modify phosphatase thus reducing the phosphorylation and aggregation. They are also microtubule stabilizers. The therapy also include immunotherapy for aggregated neurofibrillary tangles.

Anti-neuroinflammatory therapy: this therapy includes microglia and astrocyte modulators, insulin resistance modulators and microbiome therapy. Since the cause of inflammation in body could be multifactorial hence the additional medications might be the requirement in this therapy.

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Evaluation of Anti-diabetic Activity of Different Fractions of Amorphophallus paeoniifolius D. Leaves Using In Vitro and In Vivo Models

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Abstract

Diabetes mellitus is a metabolic disorder characterized by persistent high blood glucose level. It has been established that Amorphophllus paeoniifolius corm possess anti-diabetic property. In this study, different fractions of Amorphophllus paeoniifolius D. leaves were used to evaluate antidiabetic activity using in vitro and in vivo models. After collection, shade drying and defatting with petroleum ether, maceration was done to obtain three different fractions. followed by Phytochemical. IC50 of Water extract and Methanolic extract was found to be significant at 144.602±17.81 µg/ml (Water) and 148.347±17.85µg/ml (Methanolic) for α-Amylase and 124.004±25.87 µg/ml (Water) and 150.605±23.363 µg/ml (Methanol) for α-Glucosidase assay. LC_{50} study was done. In vivo study was done on Zebrafish by inducing diabetes. DPPH free radical scavenging activity and H_2O_2 scavenging activity were also performed. SGOT and SGPT Activity tests were performed. Water and Methanolic extract at 40 mg/dl each showed the most significant outcome for antidiabetic activity. The IC50 of the water extract for both antioxidant activities were 176.19±18.053 µg/ml and 142.79±14.95 µg/ml respectively. The water and methanolic extract at 10 mg/dl showed the highest hepatoprotective effect. From the study it can be concluded that the leaves of Amorphophallus paeoniifolius significantly shows antidiabetic activity, antioxidant and hepatoprotective effects.

Keywords

Antidiabetic, Amorphophallus paeoniifolius, Zebrafish, α-Amylase, α-Glucosidase, DPPH, H_2O_2, SGOT, SGPT

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Neuroprotective Activity of Solanum Giganteum Leaves Extracts on 3-Nitropropionic Acid-induced Neurotoxicity in Rat Striatum

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Abstract

Objective: To estimate the effect of Solanum giganteum leaves extracts against 3-Nitropropionic Acid (NP) induced Huntington's Disease (HD) type in the rats.

Methods: The work was designed to persuade HD by chronic administration to 3-NP at a dose of 15 mg/kg, i.p. for 21 days in rats and rats are divided into seven groups, i.e. normal, negative control and standard groups and four groups of Solanum giganteum (chloroform extract (SGC100 and 200 mg/kg) and alcoholic extract (SGA 250 and 500 mg/kg) p.o.), where as these groups treated and examined till the 21 days of an experimental trial. The behavioural, neuronal, and biochemical parameters were established during or end of the experiment. Histological alteration in the brain and DNA fragmentation were also observed.

Results: 3-NP at a dose of 15 mg/kg, i. p. had significantly induced dementia and Solanum giganteum leaves chloroform extract 200 mg/kg, p. o., overcomes therapeutic effect against 3-NP of HD type in rats.

Conclusions: Solanum giganteum Jacq of chloroform extract exerted neuroprotective action against 3-NP induced behavioural parameters such as cognitive deficit and locomotor impairment. Further, 3-NP-mediated biochemical changes were reversed, where Solanum giganteum Jacq of chloroform extract was able to correct oxidative stress and neuroinflammation in hippocampus and cortex regions.

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Physicochemical, Extraction and Preliminary Phtyochemical Screening of Root of Guziotia abyssinica (L.f.) Cass

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Abstract

Ayurvedic and traditional system of medicine is gaining importance day by day. About 80% of the Indian population depends on traditional system of medicine for the treatment of several diseases. Increasing population relying on herbal plants and the product prepared from the herbs and because of the same plant need to be scientifically screened out. In the present investigation root of Guziotia abyssinica (L.f.) Cass. Was evaluated for physicochemical, extraction and phytochemical screening.

In the last few years there has been an exponential growth in the field of herbal medicine and these drugs are gaining popularity both in developing and developed countries because of their natural origin and less side effects. Many traditional medicines in use are derived from medicinal plants, minerals and organic matter. A number of medicinal plants, traditionally used for over 1000 years named rasayana are present in herbal preparations of Indian traditional health care systems. In Indian systems of medicine most practitioners formulate and dispense their own recipes. The World Health Organization (WHO) has listed 21,000 plants, which are used for medicinal purposes around the world. Among these 2500 species are in India, out of which 150 species are used commercially on a fairly large scale. India is the largest producer of medicinal herbs and is called as botanical garden of the world.

Guizotia abyssinica (L.f.) Cass. belonging to family Asteraceae (Compositae), commonly known Niger, blackseed (E) Ramtil, Kalatil (H). It is an erect, stout, branched annual herb, grown for its edible oil and seed. The plant is used traditionally in antimicrobial agents, contraceptives etc., Besides this, it has been utilized in medicines for thousands of years.

Keywords

herbs, roots, phytochemical screening

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Effect of leaves of Dendrophthoe elastica on kidney stone and nephroprotective acitivity by rat

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Abstract

Dendrophthoe elastica having a place with the family Loranthaceae is a less realize Indian mistletoe developing normally on mango tree as hemiparasites. Indian mistletoe developing generally on mango tree (Mangifera indica) as hemiparasites. They join to and infiltrate the parts of a tree or bush by a design called haustorium through which they ingest water and supplements from the host plant. In India 6 mistletoes are considerd to have restorative properties in which two has a place with sort Loranthus and four to the variety Viscus. It is hemiparasitic dichomously extended ,glabrous pendulous bush with enlarged joints ,the youthful branches being green and blossoms white in variety. Leaves are inverse 4.5-8.5 * 2-4 cm ,praise or curved elliptical base uncaring or shorten ,zenith ,intense or obstuse ,thickly coriaceous ,glaucous underneath, essentially three nerved sessile or sub sessible. Leaves contain sterols ,terpenoids ,flavones, tannin and glycosides ,alkaloids ,quinones. the leaves cantains different helpful activity like cell reinforcement acitivity ,antimicrobial acitivity, antihyperglycemic acitivity,diuretic and so on.

Keywords

Dendrophthoe elastica, danser helicanthus elastica,loranthus elastica, lorabthus euphoribiae.etc

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Pharmacokinetic Study of Fluoxetine alone and its combination with allicin against chronic stress in rodents

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Abstract

Major Depressive disorder (MDD) also called Depression is a major disabling disease that badly influenced more than 260 million people lifespans worldwide and also top contributor of global functional disability in following decades. The Diagnostic and Statistical Manual of Mental Disorders (DSM-5) detailed the symptomatic characteristic of depression as by cognitive impairment, feeling of guilty, fatigue, weight loss or weight gain, decreased concentration and recurrent suicidal thoughts meaning that approximately 10% adult experiencing a symptom during a year. Nowadays Marketed drugs are available for the treatment of depression but their functional activity depends only on symptomatic that is not suitable to decline their mortality rate. Our study involves the Pharmacokinetic study of allicin (10mg/kg, oral) as a flavonoid that was used alone as well as and in combination with fluoxetine (10 mg/kg, oral), (SSRI) against chronic stress induced depression model in rodents. This study set an example that nowadays maximum individuals suffers from neurological imbalance which need to be overcome by using herbal plants.

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Heptoprotective Effect of Ethanolic Extract of Artocarpus Hertophyllus Leaves against Rifampicin Induced Hepatic Damage in Albino Rats.

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Abstract

The liver has two massive section referred to the left and right lobe. The Gall Bladder is found under neath the liver in conjunction with elements of the duct gland and viscus.

The liver and these organ works along to digest absorb and method food . The main works of the liver is to filtration of the blood from the GI tract before tranfering to the remainder of the body. The liver conjointlly detoxification chemical and metabolisoms medication. The liver secrets the gall that land up within the viscus Rifampicine is a types of antibioticswhich is used in the treatment of mycobacterial infection . It is also used in treatments of leprosy and tuberculosis Artocarpus Hetrophullus is also known as Jacks fruits or Jack tree . The fruit length of Artocorpud Hetrophyllus is 1.5 feet and tree length 10 to 25 meters.The diameter of Artocorpus hetrophyllus is grow upto 6 meters within five year .The fruits wt. 3 to 20 kg jacks fruit are help in the control of flood and crosion.

Key Words

Artocarpus Hetrophyllus Rifampicine, Jacks fruits Liver Katahal.

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Multi-target directed drug designing for Alzheimer's disease

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Abstract

The global prevalence of Alzheimer's Disease (AD) has doubled since 1990, with more than 50 million people living with some form of dementia. Despite extensive effort (notably on amyloid-based mechanisms), there are currently no drugs available to treat AD that can improve clinical symptoms permanently and with moderate efficacy. The development strategy for AD drugs has changed recently, with amyloid-based targets being switched to other targets, like tau proteins and various neurotransmission pathways (cholinergic, glutamatergic, serotoninergic etc). In our lab, we primarily focus on SBDD and the pharmacophore modelling approach for drug discovery followed by experimental validation of the potential drug targets. In a recent study, by targeting two crucial proteins of neurotransmission pathways (β-secretase and acetylcholinesterase) and by focusing on a database of 1000+ natural compounds along with some newly designed molecules (by using green chemistry protocols based on pharmacophore mapping), we have successfully identified a selected number of molecules with potential inhibitory efficacy towards multiple neurotransmission pathways of AD. We believe the inhibitors identified in 'in-Silico studies act as effective therapeutic targets in the future.

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Pharmacological Aspects of Quisqualis Indica Linn and its Medicinal Properties

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Abstract

Treatment of chronic diseases like Rheumatoid Arthritis, Diabetes, stroke, heart disease etc. when treated with herbal bioactives considered as promising and more suitable due to its minimum or no side effect and therapeutically effective treatment. These herbal bioactives as herbal medicine obtained from plant source and vegetable source so called as natural sources. From the past two decades, herbalists are using phytogenic agents for the treatment of several chronic as well as acute diseases. In this review article, we had explained briefly about Quisqualis Indica Linn plant as medicinal plant. This plant has been approved as medicinal plant but still used rarely as medicines so this view contrast on medicinal properties of Quisqualis Indica Linn. so as one can utilize in medicinal purpose. Other important application of this plant as for decoration, ornamental purpose. It is evergreen plant and does not depend upon seasons to grow, and available easily. Quisqualis Indica Linn contains phytochemicals such as L-Plorin (α-amino acid), Quisqualic acid (against AMPA receptor), Trigonelline (Alkaloid), L-Aspargine (α-amino acid), Rutin (flavonoid) two forms of cysteine synthase are as Isenzyme A and Isoenzyme B. These phytoconstituents responsible for the various pharmacological activities such as anti-inflammatory activity, antipyretic activity, antibacterial activity, antiseptic activity, immunomodulatory activity, antianthalmentic activity.

Keywords

Quisqualis Indica Linn, phytogenic agent, herbal bioactives, pharmacological activiithy, alkaloid, flavonoid.

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Evaluation and Effect of leaves of Cucumis operculatus on analgesic and antipyretic activity by albino rat.

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Abstract

Algesia, also known as pain, is a vague, unpleasant sensory and emotional experience connected to actual or potential tissue damage. It can vary from person to person and even within the same person at times. A temperature of 38.3 °C (100.9 °F) or greater for longer than three weeks without a clear cause, despite appropriate research, is referred to as a fever or pyrexia. Excessive heat exposure can result in hyperthermia, which can elevate body temperature without any obvious clinical causes. A substantial monoecism annual climber is Cucumis operculatus. It is considered a wild variant of cultivated plant and is native to India's western, central, and southern areas. It has tiny flowers, fruits, seeds, and leaves. A huge climber with palmate 5-7 angled or lobed leaves that is found in the wild in northwest India, Bihar, Bengal, Sikkim, and Assam, as well as in Madras. The reported chemical analysis of Cucumis operculatus revealed the presence of carbohydrates, carotene, fat, protein, amino acids, and also the presence of alkaloids. Cucumis operculatus is the source of many therapeutically significant chemical constituents. Studies have established its effectiveness in treating diabetes, immunomodulation, tumor suppression, parkinsonism, antimicrobial, ulcer, and hepatoprotection. Additionally, they are employed as anti-inflammatory, analgesic, antibacterial, ant cataleptic, ant proliferative, antioxidant, and antipyretic medicines.

keyword

cucumis operculatus, cucumis species, chemical constituents, growth and distribution, medicinal use, Pain, Inflammation, Fever, Analgesic, Antipyretic.

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Pre-clinical Evaluation and Comparison of anti-diabetic drugs along with anti- dyslipidemia drugs for its synergistic action by using Rat Model

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Abstract

During the last decades, Diabetes is associated with altered cholesterol metabolism that may contribute to cardiovascular complications. Not only diabetes, also India has 45 million patients of cardiovascular disease which increasing rapidly day by day. Therefore, there is needful to overcome the complications of diabetes and hyperlipidemic. So, our study was carried out to find out the pre-clinical evaluation and comparison of anti-diabetic drugs along with anti-dyslipidemia drug for its synergistic action. In this study Alloxan induced diabetic model and High-lipid diet model were used to induce diabetes as well as dyslipidemia, which further reduced by using alone of Atorvastatin, Glimepiride and Pioglitazone as well as combination of these anti-diabetic with anti-dyslipidemia drug (atorvastatin + Glimepiride, and Atorvastatin + Pioglitazone) respectively. Atorvastatin was administered orally dissolving into portable water at the rate of 20mg/kg alone and in combination with glimepiride (1mg/kg, oral), Pioglitazone (20 mg/kg, oral) was used in the study. Chronic and histopathological study was performed for the microscopic examination of biopsy under microscope. For future perspectives, this synergistic combination may be useful to decline the serious side effects of diabetic and cardiovascular patients.

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Right Pleural Effusion with Right Mass Lesion

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Abstract

A pleural effusion is a suprising aggregate of moisture encircling the lung.
• The serous membrane that underlines the exterior of Lungs and on the side of chest wall. At the time creature encounter a hydrothorax, fluid assemble climb in the extent middle film of pleura.
• Consistently, teaspoons of watery molten are in the pleural volume, anywhere lungs to displace evenly in chest cavity during breath
Types:
• Transudative: Hydrothorax moisture is alike to the fluid ordinarily present in thoracic space. Bronchitis-related liquid leakage is what causes formation. Except in extreme cases, this variety seldom ever needs to be drained. The most frequent cause of this type is congestive heart failure.
• Exudative: This appears from protein, blood, inflammatory cells or occasionally bacteria that discharge across impaired blood vessels into the serosa. Can require becoming exhaust, turn on its proportions and hugely inflammation there. The sources of this kind involve pneumonia and lung cancer.
Causes:
• A broad of comodity cause a hydrothorax. Few of the most similar ones are:
Release from other organs. If a person has congestive heart failure, which occurs when the heart is unable to adequately pump blood to the body, this occurs immediately. However, it can also be caused by fluid build-up in the body that leaks into the pleural space as a result of liver or renal dysfunction. The problem is usually cancer, especially lung cancer, but other tumours that have spread to the lung or pleura can harm it.

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Effect of leaves of Nyctanthes arbor-tristis linn on hyperglycaemic and glucose loaded rats

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Abstract

Nyctanthes arbor tristis linn is usually known as night Jasmine or parijat . The plant is an individual from oleaceae family . The bush is normal seen as in the tropical and sub tropical regians of the world . Despite the fact that it is known as fancy shrub,it is rich is restorative qualities and pharmacological properties . Nyctanthes arbor tritis linn is local to Southern Asia and is tracked down in northern Pakistan& Nepal . . Nyctanthes arbor tritis linn grows up to 10 m . The bark of the plant is dull dark or brown in variety and is unpleasant and firm . Leaves are inverse praise or sharpen with edge which is whole or serrated . The petioles are long &hairy and around 5-7 to 7.7-10mm long with pivotal concavity . Venation is unicast and reticulate . The lamina is praise with intense or taper summit . Leaves of . Nyctanthes arbor tritis contains Arabinoside - A , Arabineside - B ,C&O , nyetanthine , amyrine , flone glycoside ,β-sitesterol , vit C .The leaves of plant are utilized to fix sickness like sciatica , stiffness . Leaves are likewise used to treat constant fever and inner woms . Properties like purgative , diaphoretic and diuretics are available in leaves . Juice arranged from leaves are utilized as antidate for Heptite venoms& for treating stomach related issues .

Keyword

Parijat , Night Jasmine, Harsinghar

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Preparation and Evaluation of Loratadine Nanocrystals for Solubility Enhancement

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Abstract
Cyclodextrin nanosponges are rigid, porous, biocompatible, nano-particulate three-dimensional structures that can bind to different lipophilic or hydrophilic drug molecules to form complexes, and they have been employed as drug carriers for various medications. This poster will explain how innovative carvedilol carriers can be created with new cyclodextrin-based nanosponges using the condensation polymerization process. The solubility of the carvedilol in aqueous medium is reported to have very low that is 10.42 mg/L at 25 °C, due to which the absorption and bioavailability of the drug is very low. In this poster, we will learn how to improve the solubility of the anti-hypertensive drug carvedilol. As a physical method, using nanosponges could be used to change and enhance the pharmacokinetic and pharmacodynamic characteristics of many kinds of pharmacological molecules. In order to lower the dose and dose-related adverse effects, the main goal of this poster is to explore how to improve the oral bioavailability of carvedilol through drug administration through hp-beta-cyclodextrin nanosponges. The hp-beta-cyclodextrin and crosslinking agent carbonyldiimidazole can be used to create cyclodextrin nanosponges (CDNS). Solvent evaporation could be used to load drugs

Keywords
Carvedilol, hp-beta-cyclodextrin, cyclodextrin nanosponges, carbonyldiimidazole, dimethyl formamide.

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Formulation, Optimization & Evaluation of Ritonavir-loaded Nanoemulsion

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Abstract
Ritonavir (RTV) is an antiretroviral, BCS class IV drug. It has low bioavailability, aqueous solubility & permeability. It is a potent protease and CYP3A4 inhibitor. The purpose of this study was to formulate an optimal nanoemulsion system with good stability, bioavailability, solubility, permeability and palatability. The purity & potency of RTV was estimated by U.V Spectroscopy & HPLC methods. Solubility of the drug in different oils, surfactants and co-surfactants was determined through screening. FTIR studies showed good compatibility of excipients with the drug. The optimization of the formulated NEs was performed using 22 factorial design. RTV Nanoemulsions were prepared using high pressure homogenization method. All prepared RTV formulations were evaluated and optimal system was selected. Nanoemulsion (F4) formulation containing 20% s-mix with least particle size, high drug content & drug release was selected as optimum. SEM studies on the selected nanoemulsion were performed after lyophilization. It was having the size, PDI & ZP of 115 nm, 0.301 & -30.8 mV respectively. This study shows the ability of nanoemulsion system in improving the bioavailability & solubility of ritonavir.

Keywords
Ritonavir; Antiretroviral; Nanoemulsion; bioavailability; solubility; optimization; evaluation.

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Emerging Prototype for treatment of HER2+ breast cancer patients

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Abstract

Breast cancers with Human Epidermal Growth Factor Receptor HER2-positive receptors have been found to have poorer outcomes and higher mortality rates than those with other subtypes of the disease. Amplification of gene or overexpression of HER2 can have both prognostic and predictive implications. Dual blockade of HER2 has become possible with complimentary mechanism of trastuzumab/pertuzumab and lapatinib, that bind to different epitopes on HER2 extra cellular domain without competing with each other and block downstream signalling pathways associated with tumour growth and progression. The advent of HER2-directed therapies has improved the outlook and significantly changed the treatment paradigm of patients afflicted with HER2-positive breast cancer. Additionally, novel approaches to cancer treatment are being developed to target HER2, including monoclonal antibodies and small molecules that inhibit tyrosine kinase activity. Antibodies with cytotoxic moieties or modifications that improve their immunological functions and those targeting PI3K and IGF-1R has also led to the development of rational combination therapies and to a greater insight into treatment response in patients with HER2-positive breast cancer. These newer HER2-targeted therapies have paved the way for clinical practice and have become part of the standard care in neoadjuvant, adjuvant or metastatic therapies.

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Comparative Study of I/C Inj – Tropicamide, Phenylephrine & Lidocaine Vs Tropicamide & Phenylephrine E/Ds in Phacoemulsification

Dr. Binayak Bibek Das
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Abstract

This prospective study was to compare the safety & efficacy of Intracameral injection (Tropicamide 0.02%, Phenylephrine 0.31% and lidocaine 1%) Vs Topical Tropicamide & phenylephrine eye drops (Tropicamide 0.8% & Phenylephrine 5 %) in patients with both eye cataract who were included for phacoemulsification cataract surgery where Intracameral injection was used for one eye and for the other eye, it was topical regimen. 100 patients (200 eyes) were studied for a period of 6 months (Nov 2020- April 2021)

Aim and objective

To evaluate and compare the safety and efficacy of the intracameral injection vs topical regimen in phacoemulsification cataract surgery. To analyse the systemic side effects & complications due to pupil constriction during phacoemulsification cataract surgery

Methodology

Topical regimen group: tropicamide+phenylephrine eye drops were used thrice prior to the surgery. Intracameral group: usage of intracameral injection after the first corneal incision. All patients underwent phacoemulsification under topical anaesthesia. The patient's pulse rate and blood pressure was recorded. Pupillary dilatation for the topical group was measured using slit lamp and for intracameral group, it was measured using a caliper.

Discussion

In our study using Topical eye drops – the average dilatation pre op after application is 8.24 mm . Intraoperatively the average dilatation of pupil during phacoemulsification was 6.56 mm . Using Intracameral injection - Intraoperatively the average dilatation of pupil at the start was 7.60 mm and at end was 7.52 mm The difference in dilatation between the two was about 0.64 mm . Similar results were obtained in a study conducted by ıde Faria A, Giorgi R, Cohen Salmon M where the difference of dilatation between topical and intracameral was 0.86 mm In cases with NS IV and above, usage of tropicamide + phenylephrine showed reduction in pupil size about 3-3.5 mm in comparison between pre op pupil dilatation and intraoperative dilatation whereas in intracameral injection usage there is reduction of 0.5mm providing sustained mydriasis. Conclusion

A good mydriasis during cataract surgery can decrease the incidence of posterior capsular tears , vitreous loss , zonular fibre disruption & retained cortical material . Sustained mydriasis is required in cases of nuclear sclerosis grade III-V. Patients with NS III and above had higher incidence of iritis , striate keratopathy on using tropical regimen . No evidence of PCR, Nucleus drop or retained cortical material was recorded . In intracameral group ,that had good and sustained mydriasis ,there was less incidence of iritis and Striate keratopathy . It is also useful in cases of Toric IOL where good mydriasis is required to align the IOL in place. Though size of pupillary dilatation was less compared to Topical regimen, Intracameral provided a safe, effective & sustained mydriasis throughout surgery . Synergistic effect of both the drugs can provide better results as Topical eye drops (Tropicamide + phenylephrine) gives good dilatation of pupil and Intracameral injection (Tropicamide + phenylephrine + Lidocaine) provides sustained dilatation

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Evaluation of antibacterial activity of Hydrogel formulation from seaweed polysaccharides

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Dr. CRK Reddy
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Abstract

The present work is based on extraction of sulfated polysaccharide from green seaweed Ulva lactuca harvested from natural feedstock from Kutch sea coast. The method of extraction was optimized for recovery of ulvan which is antibacterial agent. The hydrogel formulation of ulvan has been optimized using design of experts to show antibacterial activity without use of any preservative. Detailed study has been conducted of which 1% w/w of partially purified ulvan has shown maximum antibacterial activity on pathogenic bacterial species. This provides a new approach of application of green seaweed polysaccharide as new antibacterial agents which is biocompatible.

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Design and Evaluation of Naproxen Liquid Crystalline Nanoparticles as Topical Gel

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Abstract
Objectives: Naproxen is used to treat pain and inflammation caused by conditions including, arthritis, spondilytis, ankylosing and gout etc. Naproxen is categorized under Biopharmaceutics Classification System (BCS) class II (Poorly water soluble). This research aims to prepare and evaluate Naproxen loaded cubosomes as topical gel to enhance the solubility and bioavailability of the drug.
Methods: Six different formulations were prepared with various proportions of drug, amphiphilic lipids, stabilizers and plastisizers by an emulsification methodology. The surface morphological characters of cubosomes were assessed with the help of transmission electron microscope and polarizing microscope. All the preparations were evaluated for other characteristics such as pH, particle size, zeta potential, rheological behavior, entrapment efficiency and in vitro drug release studies.
Results: Among the six formulations, two of them (F3 and F6) were found to have significant results in terms of entrapment efficiency and drug release profile. The formulation labeled as F6 was found to have better bioavailability when compared to all other formulations.

Keywords
Naproxen, cubosomes, Topical gel, BCS Class II, Emulsification method.

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Development and Characterization of Controlled Release Tablets Bearing Anti Hypertensive Drug (Propranolol HCl)

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Abstract

Hypertension, anxiety, migraine, thyrotoxicosis, capillary hemangiomas, and essential tremors, headaches are treated by Propranolol HCL.It is also used to immune disorders. By employing several polymers also including xanthum gum, tragacanth gum, HPMCK4, sodium bicarbonat, eudrajit S-100, MCC, Talc, ethyl cellulose, Mg.S-tearat, PVPK-30, a dosage forms of controlled release floating tablet of Propranolol Hcl was developed in this study. All pre-compression and post-compression parameters of F1-F8 developed formulations were assessed and determined to be within acceptable ranges. When comparing to other formulation, the optimized formulation (F7) showed the highest percentage of release rate (100%) within 8 hours. According to the findings of the FT-IR investigation, there were no drug-polymer interactions .The short-term stability studies were carried out 40±2°C and 75±5 % relative humidity and confirmed no alteration were found. On behalf of getting the study results can be used in treatment of hypertension.

Keywords

controlled release, Formulation Drug concentration, Propranolol Hcl, Polymer, FT-IR, and Friability.

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Abstract

The present work basically focused on to enhancement of the disintegration by using fenugreek seed mucilage that increased the rapid disintegration of tablet with different superdisintegrants and also improved the % cumulative drug release within 30second.Mucilage were extracted by using ethyl alcohol (95%) from fenugreek seed. This isolated mucilage were evaluated for abundant physicochemical properties. FTDs were formulated by using Labetalol HCl , fenugreek seed mucilage, different superdisntegrants (like SSG, CP, and CCS) in various concentration by direct compression method. Pre- compression parameters and Post-compression studies (were detected to be within limits. The best formulation F8 had been shown good post compression parameters result in comparison to the other formulation. Accelerated stability studies (as per ICH guidelines) were divulged that all prepared FDTs were stable. Thus, the tablets were prepared by using fenugreek seed mucilage revealed the super-disintegrants properties. it was concluded that the use of fenugreek seed mucilage in composition of superdisintegrant (Sodium starch glycolate) in preparation of fast dissolving tablet of labetalol HCl shown quickest disintegration time.(i.e. 18sec.)

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Analgesic, Anti-Inflammatory Activities of Dioscorea Deltoidea and It's Insilico Studies

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Abstract
The tubers /rhizomes of dioscorea deltoidea commonly known as nepal yam belonging to dioscoreaceae family is used in the treatment of different ailments for e.g. anemia, abdominal pain , diarrhea, sore throat,etc. ethnobotanical uses of dioscorea deltoidea are: oral administration of rhizome were used to treat snake bite, the paste was applied on head to kill lices, before the invention of soap , it is was used to wash clothes due to its high saponin content. The tubers of diocsorea deltoidea were collected from the local market and were futher authenticated by department of botany CCS university Meerut. the present study was performed to see the analgesic and anti-inflammatory properties of dioscorea deltiodea. Insilico toxicity studies were also performed to find the safe dose limit of the extract of dioscorea deltoidea. phytochemical studies were also performed on the hydroalcoholic extract of dioscorea deltoidea to detect the presence of saponins, alkaloids, glycosides, steroids & carbohydrates.the extracts were subjected to analgesic activity by hot plate method and anti inflammatory activity by carrageenan induced paw edema.

Keywords
Dioscorea deltoidea, anemia, ethnobotanical uses,saponin, phytochemical studies, toxicity studies, carrageenan.

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Registration requirements for Oral Modified Release Products and Drug dossiers in Europe and Australia

JSS ACADEMY OF HIGHER EDUCATION & RESEARCH (DEEMED TO BE UNIVERSITY) MYSURU

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Abstract
European Union (EU) and Australia have various procedures and requirements that define the timeline needed to authorize the medicine that helps monitor the existence of the substance involved, making it rigid for drug approval. This study aims to understand and compare the initial submission requirements for oral modified release dosage forms in both Europe and Australia. Australia follows EU regulations and guidelines, but there are some differences in requirements, such as differences in administrative information, medicine information and labelling, compliance with meetings and pre-submission processes, foreign regulatory information, antibiotic resistance, and so on. This new submission technique was designed to significantly increase the efficacy and speed without compromising the quality, safety, or efficacy requirements of the evaluation process. This study compared the requirements as well as potential approaches to reduce errors in the dossier compilation by identifying the essential factors included in the marketing application for oral modified release dosage forms in Europe and Australia.

Keywords
Marketing authorization, EMA, TGA, Generic drug, Oral modified release dosage forms.

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Chemistry, Manufacturing, and Controls (CMC) Requirements in Dossier for the Registration of Medicine

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Abstract
Chemistry, Manufacturing, and Controls (CMC) is an integral part of any pharmaceutical product application. CMC applies to the entire product lifecycle – it starts during the drug candidate selection phase and continues through post-approval and beyond. The main aim of this paper is to describe the importance of CMC and to highlight the CMC requirements in the dossier as per ICH. The CMC covers the various procedures used to assess the characteristics of drug products and to ensure their quality and consistency during manufacturing. The quality section of the ICH CTD provides a harmonized structure and format for presenting CMC information in a dossier. If CMC procedures aren't followed and current regulatory standards aren't met, the marketing authorization will be considered non-compliant and withdrawn. In an increasingly complex global regulatory environment, proper planning and where possible, timely engagement with Health Authorities have the potential for upfront resolution of potential CMC requirements issues.

Keywords
CMC, ICH, Module 3, Quality, CTD

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Changing Scenario of Harmonized Validation Guidelines for Analytical Procedures

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Abstract

The validation is a set of procedures followed to establish, submit and maintain the evidence that the intended analytical procedure whether an assay method, potency, content uniformity, dissolution studies, identification of the main component, impurities (quantitative or limit test) determination are fit for the purpose. These validation procedures are explained in detail in "International Council for Harmonisation of Technical Requirements for Pharmaceuticals for Human Use" (ICH) under the "Validation of Analytical Procedures" Quality 2 guidelines whose revision 2 (R2) is a draft version under step 2. The guidelines include developing the validation studies and protocol which are most appropriate for a drug substance a chemical entity, biological or biotechnological entity. The guideline apart from the above-mentioned procedure can also be used for risk-based assessment for Q8 -Q10 for control strategies, and for clinical development (phase appropriate). The major updations in the guidelines are the inclusion of multivariant analytical procedures.

Some of the examples in annex 2 explain the techniques (HPLC, GC, CE) used for quantitative separation for impurities or assay, Relative Area Quantitation; for Elemental Impurities, ICP-OES or ICP-MS for purity testing; HPLC for dissolution for an immediate release dosage form; Quantitative estimation by 1H-NMR for the assay of an API and some of the techniques for biologicals.

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Orphan Drug Exclusivities Across the Global Countries: A Regulatory Overview

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Abstract
Diseases that affect no more than 6–8% of the world's population are classified as orphan or rare diseases. The orphan drugs have a unique incentive being offered to the manufactures and different periods of exclusivity granted. The Orphan Drug Act of 1983 has granted incentives to pharmaceutical manufacturers to produce medicines for the treatment of rare diseases. The exclusive 7-year marketing rights to the indication of rare diseases was one of the major legislative incentives, announcing a spectacular rise in the number of therapies for rare diseases. The Australian Orphan Drugs Program supports manufacturers in managing high cost of commercially unsustainable medicinal products due to the small number of patients. Applicants for orphan pharmaceuticals/medical supplies may be given guidance and consultations on research and development activities, by the MHLW, PMDA and NIBIO. For designated orphan drug/medical devices, PMDA provides a priority consultation system. The issue of rare disease needs individual concern irrespective of the business demands of the industry. FastTrack approval process and special status of orphan drugs including a full fee waiver for clinical trials. Provisions for the clinical development of rare diseases in India are provided under New Medicinal Products and Clinical Trials Rules, 2019.

Key words
Orphan drugs, rare diseases, USA, EU, Australia, Japan.

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Quality Control Parameters for the Standardization of Clerodendrum paniculatum Linn. Leaves

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Abstract

Clerodendrum paniculatum Linn. is an erect annual or biennial semi woody shrub traditionally used in India, China and Japan for the treatment of various afflictions like inflammation, neuralgia, rheumatism, ulcer and wounds. The present study aimed at development of quality control parameters for the standardization of Clerodendrum paniculatum Linn. leaves. Physicochemical parameters like total ash value, water soluble ash value, acid insoluble ash value, alcohol soluble extractive value, water soluble extractive value, loss on drying, swelling index and foaming index were determined. Dried powder showed characteristic fluorescence using various chemical reagents. Histochemical analysis revealed the identification and location of phytoconstituents like tannins, oils, starch and lignin which are the best tool for botanical identification and standardization of crude drug. The observation could be of great use in chemotaxonomy which will furnish referential information for exact identification of the crude drug and enable to prevent adulteration of genuine samples utilized in the formulation of herbal medicines.

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A Review on Pharmacological Activity of Achyranthes aspera Linn.

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Abstract

The medicinal plants are used for treatment of various disease because of their safety and effectiveness. Achyranthes aspera is an important medicinal herb found as weed throughout India. Achyranthes aspera has been long history of medicinal Plant. Though almost all of its parts are used in traditional systems of medicines, seeds, roots and shoots are the most important parts which are used medicinally. The review reveals that wide numbers of phytochemical ingredients have been isolated from the plant which possesses activity like Antiviral and Anti-carcinogenic, Spermicidal, Hepatoprotective, Nephroprotective, Antidiabetic, Anti-inflammatory, Immuno-stimulates, Antimicrobial, Antiparasitic, Anti-allergic, Wound Healing, Antioxidant and Hypolipidemic. The crushed plant is used in pneumonia and infusion of the root is used as mild astringent in bowel complaints. Decoction of powdered leaves with honey or sugar candy is useful in early stages of diarrhoea and dysentery. For the last few decades or so, extensive research work has been done to prove its biological activities and pharmacology of its extracts. Saponins, oleonolic acid, dihydroxy ketones, alkaloids, long chain compounds and many other chemical constituents have been isolated.

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Preparation and Evaluation of Interpenetrating Polymer Network Microspheres

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Abstract
Polymers have always been valuable excipients in conventional dosage forms, and now functions as controlled drug release and drug targeting. A blend of two or more polymers in a network where one of the links is formed in the availability of another and results in the production of a cross-linked network when polymer chains from the second network penetrate the network built by the first polymer. Synergistic improvements have been noticed in the properties of each individual network like strength or toughness. The difference between an IPN and a regular polymer blend is that an IPN swells but does not dissolve in solvents and also shows enhanced mechanical strength. IPNs do not interpenetrate on a molecular scale and form finely divided phases of only tens of nanometres in size. Enhancement of the release of short half-lived drugs can be considered as a function of the selected combination network of natural and synthetic polymers under physiological conditions.
The first crosslinked polymer network is inflated by the monomer of the second polymer, which is polymerized thereafter, in sequential IPN. In this class an IPN is formed by polymerizing the first mixture of monomer, cross-linker and initiator to form a network. The network is inflated by the second monomer-cross-linker combination, which is polymerized to create an IPN. The primary requirement is that monomer (II) and coreactants swell properly into polymer network.

Keywords
Interpenetrating Polymer Network, Sodium Alginate, Locust Bean Gum, Acrylamide Grafted Sodium Alginate, Microspheres, Emulsification crosslinking.

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Ameliorate Effect of Caffeic Acid and Simvastatin in Atherosclerotic Rat Models

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Abstract
There are several atherosclerotic disorders, and their effects are now among the leading causes of mortality worldwide. Over a decade, India spent between $200 and $250 billion on healthcare (mostly for CVDs). Changes in nutrition and lifestyle may have an impact on the course of cardiovascular disease (CVDs). NF- κβ is a component that, together with food and heredity, contributes to the onset and progression of atherosclerosis. Both natural compounds and pharmaceutical research have the potential to cure cardiovascular disorders. The goal of this study was to see how Caffeic acid and Simvastatin affected NF- κβ, lipid profile, and oxidative stress in an atherogenic diet-induced rat model. Method: 30 albino Wistar rats developed atherosclerosis and were then split into 3 groups.(i)Control: 5 ml of normal saline per kg/bw; (ii)Treatment: 5 mg/kg/bw of Simvastatin (iii) 50mg/kg/ bw of Caffeic acid. At the end of the study, lipid profile and inflammatory markers , NF- κβ were estimated, as well as aorta staining. Result: CA treatment improved the lipid profile and significantly reduced oxidative stress. Aorta staining demonstrated a significant decrease in atherosclerotic lesions. The data showed that CA is an effective therapy method for atherosclerosis, owing to its protection against NF- κβ and oxidative stress in the Atherosclerotic rat model.

Key words
CVD, NF-κβ,

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Method Development and Validation of Stability Indicating Rp-Hplc Assay for the Determination of Molnupiravir in Capsules Formulation

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Abstract

The main objective of this study is to validate a specific, simple, robust, and gradient RP-HPLC method for the assay of Molnupiravir in capsule dosage forms. The mixture of 0.1% formic acid: ACN (98:2 v/v) and 100% ACN were used as a mobile phase with gradient elution. A flow rate of 1.0 ml/min was used. A YMC C18 column (150 x 4.6 mm, 3 µm) was selected for chromatographic separation. A 260 nm wavelength was selected for the UV detector and the run was over after 16 minutes. The RT was observed at 8.8 minutes for Molnupiravir. The linear responses were observed for Molnupiravir in the range of 20-150 µg/mL with R2 = 0.999. The % RSD values for interday and intraday precision were 1.75 and 0.38 respectively. The results of system suitability such as tailing factor and theoretical plates were found 0.95 and 234265 respectively. The mean percentage recoveries ranged from 98 to 102 (RSD < 2%). The drug remains stable in solution for up to 48 hours. In accordance with ICH requirements, method was validated for all parameters. Overall, a validated RP-HPLC method for the assay of Molnupiravir in capsule dosage form was developed and successfully verified.

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Regulatory Aspects of Orphan Drugs in USA: An Overview

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Abstract
Orphan medicines are medicinal products intended for diagnosis, prevention, and treatment of rare diseases. Rare diseases are classified as diseases which impacts low patient population of a specific country. The pharmaceutical industry hasn't shown much interest in developing orphan drugs under normal market conditions due to high cost of R&D, less patient population, unclear timeline of cost recovery and less chances of success. Orphan drug regulations in USA provide incentives to sponsors, researchers and drug manufacturers to invest more in Orphan Drug Research and Development, provides exclusivity and grants, accelerated approval and also provides free pricing in order to enable sponsors to recover costs. The objective of this study it to perform a structured analysis of US Orphan Drug Classification; regulations and its key features, exclusivity and patent rights, pricing of orphan drugs and the trends over the years; role of patient organizations in key policy and decision making related to orphan drug development, marketing and commercial opportunities of orphan drugs as a result of different economic and research incentives and grants.

Keywords
Rare diseases, Orphan drugs, Orphan Drug Designation, Patent and Exclusivity, Pricing, Patient Organizations.

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