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National Conference

IET Bhaddal
Technical Campus, Ropar

JOURNEY OF A DRUG MOLECULE : FROM RESEARCH TO PATIENT

(An Interdisciplinary Conference)

SOUVENIR

Organized by

INSTITUTE OF PHARMACEUTICAL SCIENCES BHADDAL

Editor
Professor Jitender Singh

In collaboration with

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Knowledge | Wisdom | Fulfilment
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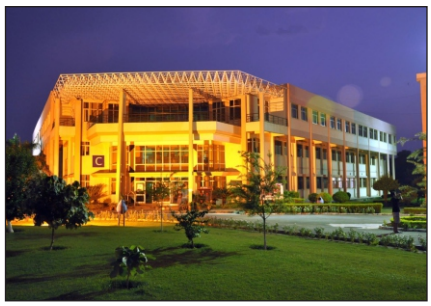


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PREFACE

PREFACE

On behalf of the conference committee, I would like to extend my warmest welcome to all of the attendees to the National Conference on "Journey of a Drug Molecule: From Research to Patient (An Interdisciplinary Conference)" organizing by Institute of Pharmaceutical Sciences, Bhaddal, District Rupnagar (Ropar), Punjab during 25th-26th November, 2022.

As the Principal of Institute of Pharmaceutical Sciences, Bhaddal; National Conference-Convener & Organizing Secretary; Member of Conference Steering Committee and Chairman of Local Organizing Committee, I would like to take this opportunity to convey my appreciation to the various organizing committees for untiring efforts to manage this conference and to achieve the goal.

Considering the responsibility as an academic Institution of higher education, IPS, Bhaddal decided to organize the National conference and provide a common plateform to the researchers, scholars, students, faculty and experts to share the updates on the conference theme with the view to motivate the youngsters, to provide the chance to interact with the professionals of various domains to update their knowledge and to generate the new research ideas from the current updates.

The conference souvenir contains the lead lectures and abstracts presented by Lead Lecture Speakers and the participants during the National Conference. The conference was organized in a well organized and systematic manner and discussed wide variety of topics on Pharmaceutical Sciences, Drug Discovery & Development, Manufacturing of Dosage Forms, Quality Control & Quality Assurance, Natural Products, Medicinal Chemistry and Phytochemistry, Clinical Research, Drug regulatory Affairs, Pharmacovigilance, Patient Counseling, Sales & Marketing of Pharmaceuticals, Drug Toxicity, Forensic Analysis, etc. from the speakers and participants of various interdisciplinary sciences.

I would like to thank students, professionals, scholars of many Institutions from various states of India, who supported and participated in the National Conference as well as for their contributions to this Souvenir.

Many thanks to Biosafe India Pvt. Ltd., Ranchi, Jharkhand for sponsoring the conference.

We also express my sincere acknowledgment to Dr HK Pratihari, Director and Dr Rakesh Yadav, Dean (I/C) Academics - National Forensic Sciences University-Tripura Campus, a Central University under the Ministry of Home Affairs, Government of India for their support and technical collaboration in the conference.

My special thanks go to faculty, staff and students of IPS Bhaddal who worked hard to organize the conference in a successful manner.

I would like to thank the Chairman and Registrar cum Director, IET Bhaddal Technical Campus for granting the permission to organize the conference and their unconditional support.

Thank you,

With Regards.

Professor Jitender Singh
EDITOR-SOUVENIR
Convener and Organizing Secretary-NC
Principal-IPS Bhaddal, Ropar, Punjab

MESSAGES

MESSAGE

It is a great moment to write message for the Souvenir published on the contributions of Lead Speakers and the participants who presented their research, hypothesis, case studies, literature during the National Conference organized jointly by NFSU, Tripura Campus and IPS, Bhaddal, Punjab.

I highly appreciate Professor Jitender Singh for his dedication, will power, collaborating attitude and capacity of logical planning of this National Conference 2022, which will enrich the pharmacy professionals.

I thank to all participants and speakers and wish all future endeavors.

With good wishes!

21/11/22

Dr. Rakesh Yadav
Dean (I/C) Academics, NFSU-Tripura Campus
Convener and Organizing Secretary-NC

MESSAGE

I congratulate the Principal and Managing Director of Institute of Pharmaceutical Sciences, Bhaddal for conducting National Conference on the theme "Journey of a Drug Molecule: From Research to Patient" and providing a good platform to the participants.

I appreciate the publication of Souvenir from the conference proceedings.

Hope this technical collaboration for organizing conference with IPS Bhaddal, Punjab and NFSU, Tripura Campus will go further also to train the manpower.

With best wishes.

21/11/22

Dr. H.K. Pratihari
Director
NFS-Tripura Campus

MESSAGE

I am pleased to write the forwarding message for the Souvenir published on the contribution of the Lead Speakers and participants from various Institutions who participated in the National Conference organized by Institute of Pharmaceutical Sciences, Bhaddal under the leadership of Professor Jitender Singh, Principal. I appreciate the efforts of faculty and students of IPS, Bhaddal who worked hard and make it a successful event.

I congratulate all the Participants and the guests who came across from different Institutions throughout India and made this National Conference a great Success.

With Best Regards.

S S BINDRA
Registrar cum Director
IET Bhaddal Technical Campus
Ropar, Punjab

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KEY NOTE SPEAKER

EMERGING FRONTIERS IN PHARMA RESEARCH FOR ATTAINING PATIENT-CENTRIC QUALITY EXCELLENCE AND REGULATORY EXCELLENCE

Professor Bhupinder Singh Bhoop
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Abstract

We are amidst a highly quality-conscious era. Quality of drug products, in particular, is considered quintessential not only to meet the patient demands and regulatory compliance, but also as the major driver for accelerating pharmaceutical growth, excellence and economic potential.

India, by and large, can take immense pride in its pharmaceutical industry, it being one of the biggest producers of quality generics and biologicals across the world. During the last a couple of years in the Covid-era too, it has reiterated its “Pharmacy Capital of the World” status by supplying essential medicines and vaccines to the world in need. The role of pharmaceutical scientist, accordingly, is considered to be pivotal in handling diverse tasks starting from the early stages of drug discovery, preclinical screening, product development, manufacturing and clinical trials, extending to the postmarketing surveillance and pharmacovigilance monitoring stage. Implementation of modern paradigms has lead to notable transformation in quality outcomes of various medicines. The vital pharma domains benefitted from these mostly in silico frontiers, mostly in silico ones, encompass CADD, ADMET prediction, microfluidics using “Organ-on-a-Chip”, Near-IR and Raman spectroscopic tools for process analytical technology (PAT), 3D-printing of diverse devices, precision medicine, bioequivalence waivers using in vitro/in vivo correlations (IVIVC), multivariate chemometric techniques, and so on.

Today, the traditional pharma concepts are withering away to provide surrogate space for newer concepts in significant transformation of quality from the current state to the desired state. To cope with these colossal changes is an onerous challenge ahead for the contemporary Indian pharma scientist. As every cloud has a silver lining, these escalating changes and challenges have enormous capability towards the emergence of newer opportunities too. The need of the hour is to find the meaningful and tangible ways to bring Indian pharma sector at par with that of the global standards. The “vigors”, nevertheless, cannot be accomplished without undertaking “rigors”. We need to be crusaders by consolidating our collective experiental and experiential vision in order to bring in this desired quality transformation.

Today, the Indian pharma industry has been undergoing quite a metamorphic and frenetic phase, as almost all the generic products, esp. for overseas filing, have to be now federally-compliant to newer guideines of Quality by Design (QbD) too. QbD is verily a systematic approach, driven by scientific knowledge towards product and process understanding, applicable to continuous improvement of drug product quality without periodic quality checks. Endorsement of International Council for Harmonisation (ICH)’s QbD guidelines (ICH Q8 to Q12) by key federal agencies, like USFDA, WHO and EMEA, offers a definitive testimony to the utility of such paradigms. With QbD in place, emphasis now is on provision of "scientific evidence”, but not merely of "documentary evidence". Today, myriad meritorious visages of the QbD paradigms have permeated to the entire product development life cycle; be it API development, analytical development, manufacturing process, herbal extraction, biosimilars and above all, to the drug products through a science

christened as "Formulation by Design (FbD)". Besides FbD, notable strides have been made in the domain of Analytical QbD (AQbD), particularly in the last a few years, with the ICH recently promulgating a newer guidance document, ICH Q14, encompassing the systematic and pragmatic paradigms of AQbD in analytical development too.

Adoption of such systematic approaches has been yielding innovative drug products marked with robust quality, enhanced resource economics and hassle-free regulatory compliance. The challenges, issues and concerns on such modern paradigms, their implementation is eventually bringing in a win-win situation for all the stakeholders viz. the industry, the regulators and above all, the patients. The proposed talk would endeavor to provide a succinct bird's eye view on the fundamental vistas of such emerging and systematic frontiers to set the ball rolling for the experts thereof, to undertake the holistic journey of a drug molecule with the aspiring audience, from research to patient.

LEAD LECTURES

EMERGING TRENDS, ISSUES AND CHALLENGES IN PHARMACEUTICAL EDUCATION AND RESEARCH

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Abstract

Pharmaceutical education and research is presently one of the rapidly growing branch in terms of diverse innovative tools, techniques to deal with challenges faced among pharmaceutical scientist on day to day manner. Newer trends such as artificial intelligence/ data science, are being evolved and used by pharmaceutical Scientist to deal with drug discovery and drug development for safe and effective innovative products for patients against disease condition. Similarly, pharmaceutical education is also rapidly changing in terms of innovative idea of teaching and doing research among pharmaceutical scientists. Therefore, it is very essential for pharmaceutical educator/ scientist to keep himself or herself to update with these evolving/emergent changes or developments in the areas of Pharmaceutical education and research. These emergent developments not only provide solution but also raised ethical issues and challenges to deal with innovative solutions. Therefore, the present presentation is an attempt to deal or highlight various recent or emergent changes in the areas of pharmaceutical education and research and related challenges.

DISCOVERY OF DRUG MOLECULES FROM NATURE

Dr. Dinesh Kumar

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Abstract

Ancient people used plants medicinally for Plant-based medicines which treat multiple diseases. Traditional medicines give shortcuts for the development of creative new pharmaceuticals and an increasing number of naturally occurring items are demonstrating remarkable therapeutic promise in the treatment of a variety of disorders. More than one hundred new products are currently being tested in clinical trials, the majority of which are intended to treat cancer or infectious diseases. Several medicinal medications are obtained from natural sources, especially plants. The marine population may have a "blue drug bank" of anticancer compounds with diverse chemical structure groupings. Step-by-step evolution from preclinical to clinical examination of natural anticancer substances (resveratrol, curcumin, betulinic acid) etc. This progression is shown in terms of anticancer modes of action, chemotherapeutic or chemopreventive drugs, and sensitizers. Many fungal endophytes produce plant-derived metabolites that are helpful from a pharmacological standpoint. These remedies contain mixtures or concentrated plant extracts. Modern medicine needs active chemicals. Cancer, degenerative diseases, HIV/AIDS, and diabetes are difficult to treat. Isolating "active chemical" makes it ineffective. Drug discovery candidates must be evaluated for safety, pharmacokinetics, and effectiveness. Here we discusses plant-based drug discovery.

GENERAL BEHAVIOR OF RODENTS IN EXPERIMENTAL PHARMACOLOGY

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Abstract

All substances, such as medications or devices that are meant for human use must first undergo appropriate animal testing. Rats and mice areamong the most often employed animal species in behavioural neuroscience research. They are excellent model organisms because they exhibit a range of characteristics that are relevant to human illness. The rat was the most popular model organism in the early stages of neurobehavioral research as they perform very well at many common neuropharmacological tasks, and their size makes more intrusive operations easier. However, mice are widely used for manipulation of genome, which allows scientists to explore the role of individual genes on the development and behaviour. There are numerous behavioural tests available for laboratory rodents, including test to assess locomotor, muscle relaxant, social behaviour, memory, depression, motor functions, sensory functions etc. The present lecture will enlighten a brief overview of most commonly used behavioural tests in rats and mice used in experimental pharmacology.

Keywords: Experimental Pharmacology, Rodents behaviour, Clinical Studies,

CREATIVE IDEA TURNED INTO INNOVATION IN NATURAL PRODUCTS

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Abstract

Natural products have remained main source of medicines since time immemorial in treating various ailments. It has been considered that a blend of spiritualism, magic and medicine play important role in therapeutics of traditional system of medicine without much scientific validation. Natural products contain lead molecules, which can be developed as such modern medicines or modified to semisynthetic / synthetic derivatives with wider efficacy and safety profile. The well-established therapeutic potential of leads obtained from natural products such as morphine (Analgesic), artemisinin, quinine (Antimalarials) and paclitaxel (Anticancer) have attracted attention of researchers to explore natural resources with a view to develop newer, efficacious and safer medicines. Even few commercially available synthetic drugs have been developed after modification of leads obtained from natural resources. A semisynthetic derivative of morphine, Apomorphine has been developed, which is used in Parkinson's disease. Sodium cromoglycate,a bronchodilator drug has been developed after modification of Khellin (a coumarin isolated from Ammi majus). Galegine isolated from Galega officinalis has been modified to Metformin (Antidiabetic drug).

The creative idea of Sir Friedrich Wilhelm Adam Sertürner, a German Pharmacist, made him the first to isolate morphine from Opium in 1803, and to study effects of morphine. His idea helped other persons to isolate alkaloids from plant sources. Later in 1816-17, Pierre-Joseph Pelletier and Joseph-Bienaimé Caventou isolated emetine from Ipecac, and strychnine and brucine from Nux vomica. A creative idea and hard work of Tu youyou led to the discovery of artemisinin from Artemisia annua for the treatment of malaria, and saved millions of lives. She received 2015 nobel prize in Physiology or medicine for her significant contribution in developing tropical medicine.

The roadmap for discovery of newer medicines from plants involve selection of plant drug based on its traditional reports, preparation various extracts, in vitro or in vivo evaluation of extracts, bioactivity-directed fractionation of bioactive extract, isolation of bioactive constituent(s) using appropriate chromatographic techniques and characterization of isolated constituent(s) using spectroscopic techniques.

Keywords: Natural products, Traditional uses, Bioactive compounds, Isolation techniques.

DRUG DISCOVERY AND DEVELOPMENT (D3) : LAB TO SHELF

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Abstract

With several disease outbreaks, drug discovery anddevelopment has been essential tool is saving livesand ensuring the standard health status. The components of D3 such as designing drugs of newly occurring diseases, modify drugs to reduce and control side effects as well as meeting the intended effects, discover and design drugs for untreatable conditions, control the drug resistance by designing new drug candidates, and collecting the data related to adverse effects helps us for the development of new ligands.

A series of N-benzylated (pyrrolidin-2-one)/(imidazolidin-2-one) derivatives were synthesized and evaluated for anti-Alzheimer's activity. The analogs were designed and synthesized based on lead compound donepezil, which is currently prescribed as a major drug for the management of mild to severe Alzheimer's disease. Considering the SAR of the lead compound, we firstly replaced 5,6-dimethoxy-1-indanone moiety with N-benzylated (pyrrolidin-2-one) / (imidazolidin-2-one) (head) without depriving the key functionalities interactions like carbonyl and dimethoxyphenyl, and secondly substituted the spacer linkage (tail) in donepezil. The newly synthesized compounds characterized by structural conformity and purity using various techniques. The compounds were then subjected to in-vivo (Behavioural studies) and in-vitro (Biochemical assays) evaluation using appropriate animal models against the standard drug. Compounds 3-(4-(4-fluorobenzoyl)-piperidin-1-yl) -1-(4-methoxybenzyl)-pyrrolidin-2-one and 1-(3,4-dimethoxybenzyl)-3-((1-(2-(trifluoromethyl)-benzyl)-piperidin-4-yl)-methyl)-imidazolidi n-2-one displayed excellent anti-Alzheimer's profile while rest of the compounds showed satisfactory results in comparison to donepezil.

Keywords: Drug discovery, Anti-Alzheimer's agents, Ligands, Receptors, Toxicity.

ISOLATION OF BIOACTIVE MOLECULES FROM CRUDE DRUGS THROUGH COLUMN CHROMATOGRAPHY & BIOACTIVITY-GUIDED FRACTIONATION APPROACH

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Abstract

Crude drugs are natural originated substances which are therapeutically active. The folkloric uses of crude drugs are a major point of rational research. A number of bioactive molecules were isolated from the crude drugs specially, derived from plants, like, Aristolic acid (*Aristochia indica*), Atropine (*Atropa belladonna*), Bergenin (*Caesalpinia digyna*), Butin (*Butea monosperma*), Caffeine (*Camellia sinensis*), Colchicine (*Colchicum autumnale*), Curcumin (*Curcuma longa*), Digitoxin (*Digitalis purpurea*), Embelin (*Embelia ribes*), Emetine (*Cephaelis ipecacuanha*), Ephedrine (*Ephedra sinica*), Genistein (*Trifolium*

subterraneum), Glycyrrhizin (*Glycyrrhiza glabra*), Morphine (*Papaver somniferum*), Plumbagin (*Plumbago zeylanica*), Quinine (*Cinchona ledgeriana*), Reserpine (*Rauvolfia serpentine*), Taxol (*Taxus brevifolia*), Vincristine & Vinblastine (*Vinca rosea*), Vasicine (*Adhatoda vasica*), etc. The bioactive molecules isolated from crude drugs have diversified pharmacological potential from skincare to analgesics to anticancer health problems and either used in clinical practices or generate idea for new research for the synthesis or derivatization of newer molecules from the parent molecules. Column chromatography is a technique which is widely used for isolation of a molecule from the plant drugs using silica gel or alumina as common stationery phases and organic solvents, like, petroleum ether, n-hexane, chloroform, methanol, etc. based on the nature of sample or extract and target molecule, if any. The molecule from a sample or extract is separated by the column chromatography depending on its differentials partitioning between a stationary phase and a mobile phase. Bioactivity-guided fractionation is a method in which the potential of isolated fraction is directed by its bioactivity. The fractions isolated from the column chromatography of an extract or a fraction or a sample undergoes evaluation of bioactivity. The bioactive fractions will be further proceeded to isolate the bioactive molecule in special interest.

Keywords: Bioactivity-guided fractionation, Column chromatography, Stationery phase, Mobile phase.

NATURAL WAY OF LIVING LIFE

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Abstract

Human body is made up of five basic elements called, Panchamahabhutas inhering the properties of earth (pritvi), water (jala), fire (tejas), wind (vayu) and space (akasha), which are directly related to the nature. The five elements play a significant role in the management of human health and quality life. The key concerns of natural way of living life are:

- Use regional and seasonal vegetables and fruits.
- Use similar kind of food items at a time.
- Proper chewing of food items.
- Routine yoga and exercise
- Limited consumption of food (as per requirement).
- Scientific fasting.
- Routine massage.
- Positive thoughts.
- Use of fresh foods. Avoid packed foods.

Besides of these, one should keep in mind the following things:

- What to eat and Drink
- When to eat and drink?
- How much to eat and Drink

Loving and caring the natural properties makes human mind and soul healthy and a healthy and peaceful mind make the body fit and energetic. It's one's will power, intention and interest which control the health of a person.

Keywords: Fasting, Food, Drinks, Yoga, Massage, Thoughts.

META-ANALYSIS: A TOOL FOR EVIDENCE-BASED PRACTICE IN PHARMACEUTICAL SCIENCE

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Abstract

Evidence-based research is used to generate, summarize and understand the best available practices to inform decision-making. Meta-analysis has become a valuable tool for these goals in pharmaceutical research. It is a statistical procedure for combining the results of multiple studies investigating a common intervention or issue to produce a pooled effect size and evaluate interventions' efficacy across studies. This article examines the usefulness of meta-analysisin pharmaceutical research and explainsits limitations. An attempt is made to outline the precautions that must be taken before a meaningful meta-analysis can be performed. The problems encountered include the heterogeneity of thestudies, conditions, interventions, and end-point measures. In particular, the examination of heterogeneity is vital to the development of new hypotheses.

Keywords: meta-analysis, systematic review, randomized clinical trial, pharmaceutical research, bias, quality, evidence-based medicine.

NEFOPAM HYDROCHLORIDE LOADED POLYMETHACRYLATE NANOSPHERES: DEVELOPMENT AND OPTIMIZATION BY BOX-BEHNKEN DESIGN

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Abstract

In current investigation, polyacrylate nanospheres of nefopam hydrochloride (NFH-NS) were developed by quasi solvent diffusion technique using poly (meth) acrylates by 3^5 Box-Behnken design. Drug: polymer ratio (X_1), surfactant concentration (X_2), stirring time (X_3), DP/CP Ratio (X_4) and stirring speed (X_5) were selected as independent variables. Response variables investigated were % entrapment efficiency (% EE), mean particle size, % process yield and % drug loading (% DL). The objective of current investigation was to analyze effects of operating conditions on characteristics of NFH-NS. Statistical assessment examined significance and fitting of model. Diagnostic analysis checked adequacy and reliability of models. Standardized Pareto chart illustrated that X_1 and X_5 were important factors ($p < 0.05$) affecting response parameters of nanospheres. Significant model F-value ($p < 0.05$) and non-significant lack of fit F-value ($p > 0.05$) was found which epitomized accuracy of data. Difference between adjusted R-squared (R^2_{Adj}) and predicted R-squared (R^2_{Pred}) was less than 0.2 which indicated rational agreement between regression coefficients. Smaller value of predicted residual error sum of squares (PRESS) for regression models stipulated good fit of models. Adequate precision value was >4 which indicated adequate model discrimination. Normal probability plots proved normality of response data. Externally

studentized residuals *vs.* predicted values plot revealed absence of constant error. Residual *vs.* run plot explored absence of lurking variables. Predicted *vs.* actual values plots revealed that graph was highly linear which signified that actual values of response parameters was in agreement with predicted values. Contour plot or response surface plot showed effect of operating conditions on response parameters. It was concluded that X_1, X_2, X_4 and X_5 had significant positive effect on % EE. X_1 and X_5 produced remarkable synergistic and antagonistic effect on mean particle size, respectively. X_1 and X_5 exhibited considerable positive effect on % process yield. X_1 produced significant antagonistic effect on % DL while X_4 and X_5 furnished synergistic effect on % DL.

DEVELOPMENT AND CHARACTERIZATION OF FLUVASTATIN SODIUM SOLID DISPERSION FOR DISSOLUTION ENHANCEMENT USING QUALITY-BY-DESIGN APPROACH

Dr. Neelam

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Abstract

This research aims to enhance aqueous solubility and dissolution of fluvastatin sodium (FSS) through solid dispersion (FSS-SD) production using polyethylene glycol 6000 and polyvinyl pyrollidone K-30 by kneading technique. Central composite design explored the influence of polyethylene glycol 6000 and polyvinyl pyrollidone K-30 on T50% and Q90. The aqueous saturation solubility of FSS (8.7 ± 1.12 µg/ml) was amplified 20-fold in FSS-SD (179 ± 4.16 µg/ml). Cumulative drug release from FSS and optimized FSS-SD were 27.49 and 87.4% within 90 min, respectively. FSS-SD production using kneading technique offers great prospective in maximizing FSS's solubility and dissolution.

STEREOSELECTIVE SYNTHESIS IN ANTICANCER DRUG DISCOVERY

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Abstract

The biological and pharmacokinetic profiles of one enantiomer can significantly differ from the other counterpart. It is well documented how quinine and quinidine, the enantiomeric twins, exert different drug profiles. Around 25% of FDA approved drugs are marketed as either racemates or mixtures of diastereoisomers which could significantly contribute to the adverse effects especially associated with the inactive isomer. For example, the (R)-enantiomer of thalidomide has sedative effects, whereas the (S)-isomer is teratogenic.In recent years, drug stereochemistry has become a significant concern for the pharmaceutical industry and the regulatory authorities emphasising on the stereoselective synthesis of drugs and drug candidates.

The present work describes how a one-pot, multicomponent, enantioselective synthesis of spiroheterocyclic anticancer ligands has been achieved employing [3+2] dipolar cycloaddition reaction. The presentation also covers several newer approaches to drug design and drug discovery with reference to the research work of the author/speaker.

JOURNEY OF A DRUG MOLECULE: AN IN-SILICO APPROACH

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Abstract

India is regarded as Pharmacy of the World. We are excelling in manufacturing of Generic Medicine, however, there is a huge prerequisite to Design and Discover novel molecules and strengthening R&D culture in our country, in order to come out with novel drug. It takes years and huge investment for a "Molecule" to become "Drug" and has to cross stages from basic laboratory research at multidisciplinary level to preclinical and clinical trial. Eventually, many of the drug fail due to safety and potency issues. The failure rate may be decreased and success rate of drug finding may be improved with preliminary In-silico approaches. Herein, various structure based and ligand-based drug designing approaches are discussed with their rational use so far so as to cut down time and money, which has been proved with many success stories.

Keywords: Drug molecule, In-silico, Preclinical, Clinical, Ligand-binding.

ESSENTIALS OF MANUSCRIPT WRITING

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Abstract

Writing a scientific manuscript is an endeavor that challenges the best minds, at par with the research performed in laboratories. Scientific manuscripts should be organized in a logical format, which fits specific criteria as determined by the scientific community and area of research. Standardized methodologies are devised and followed in journals which communicate information to those in the field being discussed. A significant amount of time and effort is to be spent during the investigative stages by conducting the required research before it is submitted for publication into the public domain. The manuscript drafted to present this research must be thorough, logically presented, and factual. Experiments must be carefully designed, optimized, and replicated for research to be successful. Rapid publishing after research is significant and may help researchers disseminate their results faster, reduce the risk of being scooped, and get back to work on the next project. It must adhere to a specific language and format to communicate the results to the scientific community whilst adhering to ethical guidelines. Once the research work is published, it will allow colleagues to debate and reflect on the newly minted work embedded in the manuscript. A well-written manuscript has the following components included: a clear title, abstract, introductory paragraph, methods and materials section, discussion of results, conclusion and a list of references. Each component of a journal article should follow a logical sequence, which members of the science community have to become accustomed.

Keywords: Manuscript, Publication, Research, Journal, Format.

INSECTS AND THEIR PRODUCTS : A BOON TO DRUG INDUSTRY

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Abstract

Animals have been used as medicinal resources for the treatment and relieve of a myriad of illnesses and diseases in practically every human culture. In modern societies, zootherapy constitutes an important alternative among many other known therapies practiced worldwide. Wild and domestic animals and their byproducts for example hooves, skin, bones, feathers and tusks etc. form important ingredients in the preparation of curative, protective and preventive medicine. In India nearly 15-20 percent of the Ayurvedic medicines are based on animal-derived substances. In Unani system of medicines, about 200 drug of animal origin are described which are claimed to be beneficial for the treatment of the various ailments. Since early times, insects and their products have been used, directly and indirectly, in the medical systems of different human cultures throughout the world. The medicinal use of insects and insect-derived products is called entomotherapy. Although, entomotherapy is an ancient practice, it is still little known in the academic world. Hundreds of insect species have been used as human food, such as grasshopper, caterpillars, beetle grubs and sometimes adults, winged termites, bee, wasp, ant, cicadas, and a variety of aquatic insects. The beauty of insects, their brilliant colors and color patterns have been utilized by artists, jewelers, and designers. A number of insects were found to have been used as food, in rituals and in prevention and treatment of variety of diseases in folk and traditional medicine. In the current article, efforts have been made to compile and provide a comprehensive idea about the use of insects and their products in formulation of drugs.

Keywords: Insects, Drugs, Unani, Ayurveda, Diseases

Introduction

The present era is referred as the Cenozoic Era, "the age of man." This is undoubtedly based on the general belief that man is the dominant and superior type of animal on the surface of earth. There is no doubt that man is the most intelligent and successful creature on this planet.

In fact, man is only one of the recent products of organic evolution and he has to compete with dominant type of animals, including invertebrates, in general and insects in particular. When primitive man arrived on the earth as a product of evolution, he found that the world was already occupied and well populated with insects. The insects came into existence some 300 million years ago or more became highly developed through rapid multiplication with the help of short life cycle and by their adaptability to variety of climatic conditions on earth. The insects are mostly known for their harmful activities as pests of crops and stored products, as nuisance creatures for human life (painful bites and stings, cause of skin blisters) and as vectors of human and animal diseases. Indeed, a lot many insects are neither harmful nor useful to human beings and several species of them are beneficial to us as crop pollinators, as biological control agents and as source of useful products like silk, honey, wax, lac etc.

The insects are often considered to be one of the major biological enemies of man due to their serious and significant destructive activities. The struggle between them is perhaps a never-ending process of evolution. Insects constitute about 55% of total biodiversity and they comprise approximately four-fifths (< 80%) of all of the animals on earth. About one million species of insects have already been identified and several of them are still to be identified.

Along with their marine relatives, the crustaceans, they constitute maximum biomass, excepting for plants on earth. Due to their dominance in terms of total number of individuals (population), omnipresence in all sorts of habitats, total number of known species, their adaptability, fast and rapid rates of reproduction, their successful progress and nick-to-neck struggle with man, the 'super animal', several authors prefer to call the present era as the "age of insects" or "insect menace" or "insect world" or "the rival world" rather than "the era of man".

Since ancient times, different types of animals have been used by man for variety of purposes such as transport, source of food, medicine and other useful products. Not only, the large-sized animals but smaller ones too have been exploited by human beings. The practice of using products derived from animals is known as zootherapy. Besides the animal products, the living animals have also been used for this purpose. In modern societies, zootherapy constitutes an important alternative among many other known therapies practiced worldwide. Products such as blood, meat, whole organs from animals and even from man have been used by kings, queens, rich and reputed people to increase their beauty, looks, muscle power, fertility, sexual capacity and to treat a number of diseases. There are many examples of sacrificing animals, men, women, children for performing special religious rituals (Tantra-Mantra, Siddhi) for specific purposes including getting children, life partner, money, victory on enemy, boon from god or to get rid off from bad ailments. After the act, tissues and organs are eaten up as prasada. Animals, their parts, and their products have been used as a source of medicine for prevention and treatment of a myriad of illnesses and diseases in practically every human culture throughout the world (Costa Neto and Olveira, 2000; Costa-Neto, 1999). The primary purpose of some animal products, which were used as remedies, was food.

Lot of people consider use of zoo therapeutics as superstition, the pertinence of traditional medicine based on animals cannot be denied because a number of materials have been methodically tested by pharmaceutical companies as sources of drugs to the modern medical science. The phenomenon of zootherapy represents strong evidence of the medicinal use of animal resources. Indeed, drug companies and agribusiness firms have been evaluating animals for decades without paying anything to the countries from where these genetic resources and traditional knowledge come.

Though, plenty of folk and traditional information in this field is available, enough authentic and systematic literature and documentation are not available in this area. This area of human activity and economics must be developed and improved in every possible way. Strong database and inventories are to be prepared and then biologically active constituents of selected animal materials are required to be experimentally tested for successful drug development.

Man has recognized the medical value of insects and has used their products as therapeutic agents. Since early times, insects and their products have been used, directly and indirectly, in the medical systems of different human cultures throughout the world. The medicinal use of insects and insect-derived products is called entomotherapy or insect therapy. Although entomotherapy is an ancient practice, it is still little known in the academic world. Even so, several authors have recorded the use of insects as medicines (Gudger, 1925; Weiss, 1946; Werner, 1970; Pemberton, 1990; Valli, 1998; Maya, 2000; Kumar et al., 2022).

Insects and their products used for treatment of human diseases

A number of insects were found to have been used as food, in rituals and in prevention and treatment of variety of diseases in folk and traditional medicine. The information gathered is compiled and organized at one place and same is being presented in the following pages in an alphabetical sequence.

Ants (Cheenti): Ants live practically everywhere but are most abundant in warmer climates. There are about 10,000 kinds, or "species" of ants. Within each species there are usually many different types. Ants are social insects that live in colonies and are one of the most successful groups of insects. Ants are of particular interest because they form advanced colonies and demonstrate a high degree of social organization. They belong to the order Hymenoptera.

- Ant brood (eggs, larvae and pupae) as well as winged and wingless ants are used as food in many parts of the world, particularly by un-civilized, poor tribal people. Ant brood is sold in tribal weekly market in some parts of rural India.
- Red ants' eggs form a constituent of a medicine used for malaria by some tribal.
- Fresh ants, which have rich formic acid content, are used in making salad dressing as substitute to acetic acid in vinegar.
- Consumption of ants (Oecophylla) by pregnant women is believed to be good for their babies in Thailand. Black ants are consumed in a variety of ways: deep-fried, in soup, soaked in wine or cooked in an omelette. Dried ants are also available in powdered or in capsule form (Chen et al., 1998; Van Huis, 1996).
- According to Unani medicine, black ants are extracted in olive oil and are used for the treatment of earache and for male sex stimulation, i.e. erectile power of penis (Khan, 1911; Shukla, 1950; Kabiruddin, 1955).
- Homeopathic medicine Formica rufa, prepared from red fire ant, is an interesting a remedy that has aroused the curiosity of modern medicine because it works so well in arthritic conditions. Its chief ingredient if form,ic acid. It is also used for itching and crawling sensations upon the skin. It is also prescribed in tuberculosis, carcinoma and lupus, chronic nephritis (Sherman, www.okanaganhomeopathy.ca)
- According to early medical literature (Hindu writings as early as 1,000 B.C.) living black ants have been used for closing incisions and small perforations in the intestines, as well as suturing of surface wounds. The carpenter ants belonging to the genus Atta and Camponotus have powerful jaws, which are able to grasp objects with extraordinary firmness. In order to stitch a wound, an ant was so placed that its wide open jaws touch the edges of the skin and then they are closed holding skin in between them. Firmly closed jaws were held together and the head was cut off, the jaws remained firmly attached until the wound is healed Gudger (1925). Such practices have been performed in Asia, Algeria, Turkey and in Europe.
- In a survey study conducted by Lawal and Banjo et al., 2006 in southwest Nigeria listed medicinal use of red ant of Formica species. The paste of ant is externally applied on wounds for healing purpose. The preparation of ants, cooked with some herbs, is prescribed for "Thunder bolt" and male impotence. The ash of the ants is also useful for such treatments. A herbal formulation with inclusion of ants is said to be useful for the treatment of hepatitis "B".

Bed bug, Cimex lectularia (Khatmal): It is a member of order Hemiptera, suborder, Heteroptera and family Cimicidae. The members are ectoparasite on human beings. They are nocturnal and feed on human blood during night. During day-time they remain hidden in the cracks and crevices of the houses and furniture. They are supposed to cause skin rashes, itching and skin disorders and are also held responsible for transmission of some pathogenic microorganisms.

- According to oral information received from a traditional ayurvedic practitioner, patient suffering from malaria should be given 2-3 live bed bugs wrapped in the bread for quick healing and recovery.
- Application of dried bed bugs in and around nostrils or their gargles with wine facilitates expulsion of leech from throat. Instillation of the extract of bugs through urethral opening relieves urinary obstruction. Fumigation is good for epilepsy. Application of bed bugs, in the form of a paste, promotes hair growth. In snake bite cases, ingestion of one bug acts as a detoxicant (Khan, 1938).
- Homeopathy medicine Cimex lectularis- Acanthia, prepared from bed bugs, is used to treat intermittent fever with weariness and an inclination to stretch. It is also used in violent headache, constipation, shooting pain in vagina, and joint pains (Sherman, www.okanaganhomeopathy.ca).

Beetles (Order Coleoptera): Beetles are hard, tough and strongly built insects belonging to the order Coleoptera. Their bodies are covered by hard and tough front wings, known as elytra, which often have horny sheaths. Both of these wings meet in a straight line down the middle of their back and cover their hind wings. The group is very big having a large number of species of beetles and weevils showing profound economic importance. Many of the species are pests of agricultural, horticultural and forest crops, while maximum number of stored product pests also belong to Coleoptera. Some of the beetles damage wood and timber, still others show scavenging activities. A good number of beetles live in aquatic habitat showing scavenging and predaceous habits. The larvae (grubs) of beetles are apodous and remain in slightly curved position, while at rest. Several species of beetles are used as food and as medicine.

- Grubs of the palm weevil, Rhynchophorus phoenicis (Curculionidae) are fried and eaten in several parts of western Nigeria and in Delta and Edo states, where active marketing of the fried grubs takes place.
- Some larvae of various large beetles are also roasted, fried, or boiled by the natives of several tropical countries.
- In Uganda, the larvae of many species of the larger beetles are sought and eaten.

Dung Beetle (Gobrilla or gubrella): - It is a black coloured more or less round bodied insect found in cattle dung (gobar), hence is named as dung beetle and Gobrilla or gubrella in Hindi. It prepares a ball of dung and rolls it down to its nest in the soil. The female beetle deposits her eggs inside the ball. The hatched grubs feed and flourish in the dung ball to complete their development. The insect play a scavenging role in processing of cattle dung. Several species of dung beetles differing in their size, morphological features and colours (black, brown) have been reported. Some of the uses of dung beetles are described below:

- The Laos Indians of Siam feast upon both adults and larvae of a species of dung beetles.
- The dung beetle is a popular snack in southern China, especially - surprise, surprise - in Guandong province. Before cooking these little critters, you have to remove the hard wings on the back and lightly squeeze the head between your thumb and index finger to push out the intestines. To cook the beetles, first poach them in boiling water, then either season

them with salt and steam or deep-fry and then sprinkle them with salt and Sichuan peppercorns.

- In Unani medicine, its "Khisandah" in very small doses, removes bilious humorous of stomach and liver. It is useful in dropsy and scorpion sting. Insects fried in olive oil alleviate earache and give relief in piles. If tail of an insect is cut, a fluid exudes from the body. This is instilled in eyes for the treatment of eye diseases, the beetle, if tied on the tights of parturient women, facilitates delivery (Khan, 1911).

Fire flies (Jugnu), Scientific name: Photuris lucicrescens

Fire fly of jugunu is a beetle showing the phenomenon of light production. During rainy season flying fire flies with intermittently emitting green coloured light create a marvelous scene. The children look it with curiosity and catch hold the fly to enclose it in the pocket of the shirt or the girls enclose the insect in transparent cloth and pin it up in hairs.

- In Unani medicine consumption of one dried fly with asafetida for three days is useful in renal and cystic calculi. It is also believed to cure night blindness. Externally it is used with egg albumen for the treatment of piles. Instillation with rose oil is depurative and is beneficial in earache and deafness. Ingestion of three flies may be fatal (Hussain, 1771, Kabiruddin, 1955, Khan, 1911 & Shukla, 1950).

Blister beetle (Spannish fly), Scientific name: Lytta vesicatoria, Cantharis vesicatoria or Meloe vesicatorius - These beetles are soft-bodied insects with a green or bluish tint. They emerge in large numbers during rainy season, especially in village areas. They get attracted towards light during night time and eventually, they enter in human habitations. If they are rubbed or pressed against human skin, large sized blisters are formed due to contact with their haemolymph. Due to corrosive and blistering activity on human skin, they are named as blister beetles. The drug (cantaradin) is prepared from whole beetles or their wings. It is in the form of powder, plaster or homeopathic (tincture) formulations. The formulation is highly irritant and causes burning pain in every part of the body, both internally and externally, hence the drug is to be handled with care, it can cause blistering.

- Blister beetles are deadly poisonous and lethal dose for humans is only 0.03 gms. They are also famous for their aphrodisiac property. Their deadly potential led to a murder conviction for Marquis de Sade, who gave lytta to a women for sex arousal effect.
- Chinese and Unani physicians recommend their application to the skin to improve circulation, for local irritation and to counter infections.
- In Unani medicine they are used for kidney stones, amenorrhea and enlarged spleen.
- The chief ingredient of blister beetles to which medicinal properties are attributed is a fatty acid, cantharidin.
- Cantharidin is used in the treatment of certain conditions of the urogenital system.
- The importance of cantharidin was probably not fully realized until the Second World War when shipments of insects for its manufacture could not be arriving from Europe. The pharmacists then became disturbed when they learned that different species of beetles contained different percentages of cantharidin and that the species in the United States yield very small percentage of the drug. As a result cantharidin has not and apparently cannot be produced on a commercial scale from native blister beetles.
- It is generally used in the form of a plaster for counter irritant, rubefacient and vesicant properties. Externally it is useful in alopecia, leucoderma, moles and for promoting erectile power.

- Its use as an ingredient of hair oils, pomades and other cosmetic preparations for the promotion of hair growth is very popular.
- Owing to its irritant properties, internal administration is made very carefully and in very little doses.
- The ash of Spanishfly is of value in calculi, urinary obstruction, amenorrhea, enlargement of spleen, melancholia, spermatorrhoea, lunacy and rabies.
- Flies ground with the leaves of 'Banafsha' (Viola odorata) and mixed with olive oil constitute useful ear drops for ear-ache and deafness (Hussain, 1901, Kabiruddin, 1955, Khan, 1911, Nadkarni, 1954).
- Homeopathic remedy, Cantharis vesicatoria is counterirritant in action and it stimulates blood flow to the skin and causes blistering of the skin.
- Because of powerful irritant property Cantharis vesicatoria is mainly used externally as counter irritant and urinary tract infection.

Butterfly (Titli) & Moth (Parwana): Butterfly characterized by tiny colored scales that cover their delicate wing surfaces. The arrangement of the scales determines the color and characteristics of each species. Butterflies are belonging to the order Lepidoptera.

- Kunin and Lawton (1996) have recorded that promising anticancer drugs have been isolated from the wings of Asian sulfur butterflies.
- It is used in leprosy, skin pigmentation, moles and scabies (Khan, 1911).
- In Matinha dos Pretos, the water in which a moth has been boiled is to be drunk three times per day to treat asthma.

Cicada: The cicada is famed for its mating call. Made by the males only, each species of cicada has its own distinctive call to attract females of its own kind.

- They are best pan fried in oil. Cicadas do not have any particular taste, but have a nice crispy crunch to them and are like eating deep-fried tofu skin. The inner part is soft like the white part of a boiled egg.
- The cicada molts, or exuvia, are used in medicine to treat scrofula, a disease with glandular swellings.

Cochineal Insect (Bir Bahuti): - Scientific name- Dactylopius coccus, Coccus cacti this scale insect of Coccidae family (cactus eating insects) is native to tropical and subtropical America. It is a bright scarlet coloured, 15-20 mm long insect belonging to the family hemiptera. Its body is covered with dense velvety hair. White & black varieties are also available, but are not preferred for medicinal purpose. There are two varieties of these insects, black variety and silver variety. The later is grayish red in color and is more valued medicinally.

- It appears jut before monsoon in gardens and fields and is collected, dried, grounded and used as a saffron coloured powder.
- The insect is very popular in Siddha and Unani Tibb systems. It is considered spermatogenic and a nervine tonic.
- It is said to be a good rejuvenating (kaya kalp) agent as it protects the body from all types of toxins and saves from senescence.
- It possesses aphrodisiac, sedative and antiseptic properties and is used in neuralgia and whooping cough.
- Dried bodies of fecundated females, egg and larvae are immersed in boiling water, spread out, dried and pulverized. This powder is used as medicine.

- It possesses sedative, antispasmodic and antitussive properties (Nadkarni, 1954).
- The insects are taken in betel for improving complexion and for the treatment of paralysis and facial paralysis.
- Inhalation with lemon juice is good for amenorrhea (Khan, 1911). Application on the male organ stimulates erectile power (Anonymous 1959, 1952, Kabiruddin, 1771, Khan, 1911, Shukla, 1950, Wahid, and Siddiqui, 1961).
- In homeopathy, it is used for the treatment of chronic bronchitis complicated with gravel.
- It is also given in treatment of cough paroxysms from tickling or irritation in the larynx, renal colic, anuria, anasarca, ascites, urinary calculi, haematuria, urates, sensation of a foreign body between upper eyelid and eyeball.
- In Ayurveda, it is considered a nervine tonic in all types of weaknesses and as ingredient of some aphrodisiac preparations, particularly for external use.

Cockroach (Tilchatta): Scientific name- Blatta Orientalis, Periplaneta americana (American cockroach) Cockroaches are insects of the order Blattodea. They are one of the most ancient animals on earth with the cockroach having been around for 350 million years, since the Carboniferous period, 100 times longer than humans have lived on Earth. Cockroaches come in over 4,000 different colors and sizes of species, including 60 different species known to inhabit the United States. Cockroaches are the fastest insects on earth! They can run up to 12 feet in just one second. They live in groups and emit a pheromone that signals their body for quick growth. Cockroaches are very social and will eat anything including soap, paper, clothes, cigarette butts, coffee grinds, hair, glue, feces, human food, and sometimes even each other. Some will even eat their own cast-off skins and egg-capsules.

- The cockroaches are dried in pulverized for use in ear ache.
- They are ashed and given with honey for relief in dyspnoea, urinary of obstruction, uterine colic and for ennenagogue and abortifacient actions. The ash is administered with lemon juice for detoxicating action (Khan, 1911).
- Cockroach (Blatta orientalis) is an insect that makes most people squirm but is very beneficial as a treatment in asthmatic conditions, especially when accompanied with coughing.

Cricket (Jheengur): Scientific name- Gryllotalpa orientalis insect belonging to the order orthoptera. They have strong fossorial forelegs suitable for digging. Another of mole-cricket's claims to fame is its strong smell.

- Roasted insect is useful in colic, particularly of cystic origin.
- The insect is fried in olive oil and instilled in ear for alleviating ear ache (Khan, 1938).
- The bodies of male mole-crickets- earth-tunneling relatives of the cricket- are given in Chinese medicine for water retention, to ripen boils and abscesses, and for difficult labor.

Parts used: Bodies of males.

Active ingredients: Not known.

Actions: Cooling, increases urine production.

Medicinal use: Given in Chinese medicine for water retention, to ripen boils and abscesses to the bursting point and for difficult labor.

Preparations: Roasted, powdered and mixed with water.

Grasshopper: - Grasshoppers are belonging to the order Orthoptera. Most grasshoppers have highly developed hind legs, much stronger and larger than their other four legs. They can jump like no other animal on earth in proportion to their size. It is amazing how few

people realize that grasshoppers also possess very beautiful and colorful wing patterns that also facilitate as camouflage.

- Herbalists from Feira de Santana recommend the use of a tea made from the toasted exoskeleton to cure skin diseases and for people who have had a stroke.
- The powder of a whole toasted or sun-dried grasshopper is turned into a tea for the treatment of asthma and hepatitis.

Housefly (Makkhi): Scientific name- Musca domestica

- In Tanquinho, people crush a bunch of flies and put the mass on immature furuncles, or crush flies' heads, mix them with manioc flour and put the mixture on furuncles and rubbing the head with a mass of crushed houseflies treats baldness.
- In Matinha dos Pretos, a bunch of flies is crushed and mixed with okra (Hibiscus esculentus L.) and manioc flour and this mixture are put on furuncles.
- Ingestion of raw or cooked flies is beneficial for the eyes. Instillation in eyes with egg yolk is good for stye, inflamed and painful conditions of the eye.
- If swallowed with wine, it facilitates delivery.
- Decapitated fly is useful in wasp sting and alopecia.
- If 100 flies are put in sesame oil and later filtered, the filtrate forms a useful application for promoting hair growth and blackening grey hairs.
- In children, flies are administered according to the following dose schedule for the treatment of insomnia. One fly is administered on the first day; the dose is increased by one fly per day till the seventh day and then decreased by one fly per day (Hussain, 1901 and Khan, 1911).

Honey bee (Madhu makkhi): - Scientific name- Apis mellifera belongs to the order Hymenoptera. Honey bees provide us with honey, royal jelly, beeswax, and Propolis. They are very cooperative insects and have good colony structure. They are the prime pollinators of the planet. Honey bees are social insects, with a marked division of labor between the various types of bees in the colony.

- Honey bee has always been regarded by man as one of the most valuable allies.
- It also provides several intriguing substances that are helpful for human health.
- In Unani medicine, whole honey bee is given as a tonic & applied to stings.
- In homeopathy also, it is recommended for similar complaints (inflammation and swellings).
- Honey is applied to wounds and burns and given for lung complaints and constipation.
- Beeswax is used like honey in Eastern medicine and in the West is common in skin creams.
- Royal jelly is popular as a general tonic.
- Pollen is used to build up resistance to hay fever.
- Honeybee is also used as a food. Bee pupae are removed from the hive and deep-fried in oil then served with a dipping sauce of salt, ground chillies and ground Sichuan peppercorn.
- Young ones of bees are severed of wings, dried in shed pulverized and administered with wheat flour and sugar as a tonic.
- The secretion is applied externally on wasp sting, inflammation and pain (Hussain, 1771 & Khan, 1911).

The honeybee (Apis mellifica) is probably one of the most well known homeopathic remedies, not because it is made from an insect but because it has so many beneficial properties.

It is well known for the type of pain it will relieve: stinging, burning pains accompanied with swelling relieved by cold applications. Thereby it is an excellent remedy for certain types of sore throats and of course insect bites.

Parts used: Bee venom and venom extract; whole body; honey; bees wax; propolis, the sticky resin collected by bees from plants to glue up holes in the hive; royal jelly, a bitter testing gel secreted to feed infant queen bees; bee pollen.

Active ingredients: Melittin in venom and whole body; inhibine in honey; bees wax; propolis; pentothenic acid (B vitamin) and acetylcholine in royal jelly; bee pollen.

Actions: Counterirritant (melittin, whole body); antibiotic (melittin, inhibine, propolis, royal jelly); tonic (whole body, royal jelly, bee pollen); laxative (honey); soothes internal body surfaces (honey); sedative (honey); anti inflammatory (bees wax); stimulates the stomach (bees wax); relieves pain (bees wax); neutralizes toxic substances (bees wax).

Medicinal use:

- Venom has been used traditionally for arthritis, and venom extracts is prescribed as an antidote for bee stings in people dangerously allergic to them.
- Wingless dried bee is given in Unani medicine as a tonic or applied externally on stings and skin inflammation.
- Whole bee (Apis mellifera) is used homeopathically for painful inflammatory conditions and swellings.
- Honey is universally valued for wound, external ulcer and burn healing, is associated with longevity and vitality, is given for constipation where a gentle action is important, and is used for coughs and bronchitis (Kumar et al., 2022).
- Beeswax is given by Chinese and Unani physicians for similar purposes. In the West, herbalists prescribe wax cappings, taken from the surface of honey combs and containing some pollen, for hay-fever sufferers to build up their immunity.
- Propolis dates back at least to the time of Aristotle as an application for bruises, wounds, skin inflammation, and burns. It is now taken for mouth and stomach ulcers.
- Royal jelly has been associated with hormonal effects, but these are unproven; its best establishment effect is as a general tonic.
- Bee pollen is taken for a range of problems, from impotence to depression, but its most general use is to build up the body's immunity to pollen.

Conclusion

Insects and the substances extracted from them have been used as medicinal resources by human cultures all over the world. Besides medicine, these organisms have also played mystical and magical roles in the treatment of several illnesses in a range of cultures. Although use of insects for the preparation of curing diseases is an ancient practice, still little is known about their therapeutic potential in the academic world. Even so, several authors have recorded the use of insects as medicines and further efforts are required to be made in this direction to strengthen traditional medical system.

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ABSTRACTS

FORMULATION DEVELOPMENT FOR RESVERATROL LOADED PHYTOSOMES BASED ON QUALITY BY DESIGN APPROACH

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Abstract

Resveratrol (RSV), a well-established polyphenolic compound obtained from a variety of plants viz., berry and grape fruits, has been linked to therapeutic activities like antitumor, anti-obesity, neuroprotective, anti-aging effects, cardioprotective, anti-diabetic as well as antioxidant activity. RSV has substantial anti-adipogenic action through fat accumulation inhibition and activation of lipolytic and oxidative pathways, as well as platelet aggregation is inhibited resulting in cardioprotective action. The cardiovascular, neurological, and diabetic disorders are favourably impacted by RSV and is well tolerated. As a result, RSV may be considered the one of the excellent nutritional additive and complementary drug, particularly as a therapeutic agent. Despite promising results, RSV has had limited success, owing to its instability, inefficient systemic delivery, and low bioavailability. In this research work, the challenges faced in oral delivery of resveratrol were addressed. Solubility enhancement of RSV was carried out through hydrotropic solubilization technique using different hydrotropic agents in varying concentrations. The drug-hydrotropic agent blend was then freeze dried for hydrotropic solid dispersions. While the poor bioavailability and extensive metabolism of RSV was addressed through formulation of phytosomes by thin layer hydration method. Concept of Quality by Design (QbD) has been applied for assuring the quality development of RSV loaded phytosomes. Most significant factors were screened through risk assessment and central composite design was applied for their optimization. The developed optimized phytosomes were characterized for various parameters such as particle surface size, morphology, particle charge, entrapment efficiency and in vitro release study. All formulation exhibited acceptable value of parameters tested and were found stable. This study had shown the successful approach for development and optimization of novel drug delivery systems for RSV, which may eventually lead to increased bioavailability of this poorly water-soluble drug while successful solubility enhancement through hydrotropic solubilization technique for RSV led to increased aqueous solubility.

Keywords: Hydrotropic solubilization, Phytosomes, Resveratrol, Solubility enhancement, QbD.

QUALITY-BY-DESIGN-BASED DEVELOPMENT AND CHARACTERIZATION OF MEDICATED JELLIES FOR MICRONUTRIENT DELIVERY

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Abstract

The oral route is the most widely utilized for drugs administration since it is cost- effective, simple to give, and has a high level of patient acceptability. Jellies are a semisolid, clear, non-greasy dosage form that may be utilized both internally and externally. Chewable formulations have the advantages of not requiring water for ingestion, having a pleasing look, and having a pleasant texture. Nutritional health problems are one of the major problems of the people. That people do not intake the appropriate amount of micronutrients and hence it is major concern that

has gotten worse over time is nutritional deficiency. The present study was embraced to develop jellies of minerals to fulfill the requirement of micronutrients. The objective of the proposed work was to develop new patient-compliant dosage forms, which help the patient to fulfill the requirements of micronutrients and to develop oral medicated jellies by employing quality by design approach. Quality target product profile and critical quality attributes for jellies were identified. Potential factors affecting the quality of final formulation were identified by constructing fishbone diagram and risk assessment matrix. A central composite design (CCD) was used to optimize the different factors and 2D contour and 3D response plots were developed to demonstrate the relationships between the independent variables and response parameters. Final optimized formulations were subjected to various quality control tests, and the results obtained were promising enough to be considered a patient compliant novel dosage form for the delivery of the micronutrients.

Keywords: Jellies, Micronutrients, Quality by Design, Central composite design, Critical quality attribute.

HYDRODISPERSIONS FOR SOLUBILITY ENHANCEMENT AND DEVELOPMENT OF ORAL SUSPENSION CONTAINING ARTEETHER USING FORMULATION BY DESIGN

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Abstract

World Health Organization recommended artemisinin and its derivatives for treatment of falciparum and chloroquine resistance malaria. The most important artemisinin derivatives are artesunate, artemether, arteether and dihydroartemisinin. Among the extensive armamentarium available to treat drug resistant malaria, arteether, is the ethyl ether derivative of dihydroartemisinin is one of the most widely used therapeutics worldwide because of higher lipophilicity than artemether, results in its advantages that it accumulates in brain tissues of the patient by crossing the blood-brain barrier and effectively control cerebral malaria. It is active against P. falciparum strains by exhibiting effective erythrocytic schizonticidal activity. The major issue related with arteether includes its poor aqueous solubility (?17 ìg/mL) and low stability in the gastric medium as it degrades at the gastric pH 1.2 resulting in its poor bioavailability. Majority of arteether (? 40%) degrades in the stomach after its oral administration. The drug falls under the Biopharmaceutical Classification System (BCS) class II exhibiting low solubility and high permeability. Due to such limitations, only intramuscular injection of arteether is currently available in market, which suffers from disadvantages like patient non-compliance, pain at injection site etc. The aim of the present study was to improve the aqueous solubility of arteether and develop the reconstituted oral suspension by employing hydrotropic solubilization technique by using various hydrotropic agents at various concentrations of sodium benzoate, sodium citrate, urea, mannitol, sodium saccharin and nicotinamide Maximum solubility enhancement of 39.0 times was observed with 10% blend of sodium saccharin and 18.0 times with 10% blend of mannitol as hydrotropic agent. This study had shown successful approach of solubility enhancement of arteether and further development and optimization of oral reconstituted suspension of arteether, which may eventually lead to increased bioavailability of this poorly water-soluble drug.

Keywords: Arteether, Central Composite Design, Oral suspension, QbD, Solid dispersion.

QUALITY-BY-DESIGN-BASED DEVELOPMENT COMPLIANT DOSAGE FORM FOR PAEDIATRIC

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Abstract

Pediatric patients differed from adult patients in a number of ways relating to pharmacotherapy, such as the capacity for medication administration, drug-associated toxicity, and taste preferences. It is crucial that paediatric medications match the child size, age, and varied physiologic circumstances in the best way possible. There may be a need for a variety of administration methods, dosage forms, and strengths to ensure that every paediatric child is receiving the best possible care. Many of the current formulations for paediatrics, including tablets, capsules, suspensions, and syrups, are not appropriate. These formulations frequently cause a variety of issues in paediatrics, including choking due to larger size, vomiting due to the bitter taste of tablets and capsules, varying dosages in liquid dosage forms, intolerable pain during injections, and ethical concerns due to rectal forms. Therefore, it is necessary to provide some appealing and efficient dose forms for kids. One of the modern inventions that kids really enjoy is the medicated lollipops. Giving medicine to kids in the shape of a lollipop definitely draws their attention to the dose form and lowers their likelihood of rejecting it.

In this research work, survey has been conducted on paediatric population concerning the perspectives of their parents. On the basis of survey, paracetamol and ibuprofen was the two selected the most commonly used drugs in paediatric population and lollipop as the new innovative dosage form preferred by the most children. Medicated lollipop containing paracetamol and ibuprofen as model drugs was developed by heating and congealing method. Concept of Quality by Design was applied for assuring the quality development of medicated lollipop. Central composite design was explored for the optimization of most significant factors. Developed medicated lollipop were characterized for various parameters and results were summarized.

Keywords: Paracetamol, Ibuprofen, Pediatric, Central Composite Design, Medicated Lollipop, QbD.

THE METHANOLIC EXTRACT OF ALBIZIA ODORATISSIMA (AO) BARK ATTENUATED THE DEVELOPMENT OF DIABETIC NEPHROPATHY IN RATS

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Abstract

Methods: Healthy Wistar rats of either sex weighing 180-200g were employed in the present study. Experimental diabetes was induced in rats by injecting STZ at a dose of 45 mg/kg (i.p.). Assessment of DN was done by estimating glucose level in blood and urine sample. Moreover, different antioxidant parameters like Catalase, superoxide dismutase (SOD) and thiobarbituric acid reactive substances (TBARS) in kidney tissue sample were assessed. Additionally, inflammatory cytokines like interleukin-1 (IL-1), transforming growth factor beta (TGF-â) and tumour necrosis factor alpha (TNF-á) were assessed in renal tissue.

Results: Methanolic extract of AO bark (AOB) has shown significant prevention against diabetes associated nephropathy. The bark extracts decreased glucose level both in urine and blood sample. The AO extract either alone or in combination with standard drug (glibenclamide) showed significant reduction in oxidative stress in renal tissue, as demonstrated by increased catalase and SOD levels, or decreased TBARS levels compared to diabetic rats. Additionally, methanolic extract of AOB alone or in combination with glibenclamide significantly reduced inflammatory cytokines like IL-1, TGF-â and TNF-á in diabetic rats.

Conclusion: Our studies suggest that methanolic extract of AOB might be beneficial for the treatment of DN. The ability of AO to attenuate DN may be mediated by the inhibition of oxidative stress and inflammatory cytokines by AOB extract.

Keywords: Albizia odoratissima, Nephropathy, STZ, Glibenclamide.

ARTIFICIAL INTELLIGENCE : AN EMERGING TOOL FOR DRUG DISCOVERY

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Abstract

Drug discovery is entirely based upon trial and error method which takes more than a decade and the estimated expenditure for the process is about $2.8 billion. Since, the challenges faced by pharmaceutical industry are just about the race against time to find viable vaccines and medicines. This is where artificial intelligence comes into play. Artificial intelligence (AI) based methods are increasingly being used in various stages of the process to improve time and cost efficiency, which results in great cost saving that would indeed lower the drug cost for the patients. Gazing into the current scenario, there is a huge need to fasten the process of drug discovery and development. AI not only promises the systematical assessment of molecular characteristics (like bioactivity, selectivity, side effects, physiochemical properties, ADME), but also creates the chief molecule with favourable properties in silico. In drug design, AI provides algorithm that analyze, learn and explain huge pharmaceutical data to discover new drugs, integrate the development of machine learning in a more united and automatic manner. AI helps to evaluate the right drug and is a principal tool for clinical trials which recognizes disease in patient, identifies gene target and predict molecule with on and off target effect. Even QSAR (Quantitative structure-activity relationship) is evolved into AI-based QSAR approaches, such as linear discriminant analysis (LDA), support vector machine (SVMs), random forest (RF) and decision trees. AI can switch drug screening from bench to virtual lab, which assist in gathering results at a faster rate and can shortlist the favourable targets without the need for extensive experimental inputs and staffing hours. Thus, the future of Artificial Intelligence looks promising and it can assure a new era of drug discovery.

Keywords: Artificial intelligence, Drug discovery, QSAR, Virtual lab.

RECENT ADVANCEMENTS IN PERIODONTITIS MANAGEMENT THROUGH NON-INVASIVE TECHNIQUES

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Abstract

Periodontitis: An inflammatory disease of the periodontium induced by specific microorganisms and requires more specific treatment. According to the National Institute of dental and Craniofacial Research shows overall, 42.2% of adults 30 years or older had total periodontitis, consisting of 7.8% with severe periodontitis and 34.4% with nonsevere periodontitis. The traditional mechanical therapy alone is not sufficient for the treatment of moderate to severe periodontitis because of in accessibility in the deep periodontal pocket and depth of penetration of microorganisms into the periodontal connective tissues. Thus to overcome the limitations of mechanical therapy, local drug delivery into the periodontal pocket is recommended. Periodontitis is seen worldwide in all groups of people. Various methods of treatments were used in the management of periodontal infection. The local drug delivery of chemotherapeutic agents to the periodontal lesion site has the advantage of loading a higher concentration of drug at the target site minimizing the adverse effect of the drug on the other systems of the body. The local drug delivery system having controlled release should be considered as an adjunctive to mechanical debridement for the treatment of periodontal diseases. There are various options of antimicrobials which can be locally delivered such as metronidazole, chlorhexidine, doxycycline and tetracycline.

Keywords: Antimicrobial agent, Controlled released, Chemotherapeutic agents, Periodontitis.

RECENT ADVANCEMENTS IN OCULAR DRUG DELIVERY SYSTEMS

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Abstract

The scientist faced many challenges in Ocular Drug Delivery Systems due to unique anatomy and physiology of eye. In Ocular Drug Delivery System there are two types of barriers Static and Dynamic Barrier. Static barriers consist of different segment of eye such as cornea ,sclera, retina and blood-retinal barriers. In other way dynamic barriers consists choroidal and conjuctival blood flow, lymphatic clearance and tear dilution. These both barriers affect the bioavailability of drugs. In recent year some new concept of drug delivery such as iontophoresis ,liposome bioadhesive gels, ocular insert ,contact lenses etc has been developed to overcome problems associated by static and dynamic barriers. These formulation based aprroaches have high capacity to carry maximum concentration of drug at targeted site of eye. Anterior segment drug delivery advances are witnesses by modulation of conventional topical solutions with permeation and viscosity enhancers. Also,it includes development of conventional topical formulations such as suspensions ,emulsions and ointments. Various nanoformulations have also been introduced for anterior segment ocular drug delivery. The compiled data presented in this review will act as a good information resource and reference point for further researchers in the field of ocular drug delivery aiming non-invasive sustained release of drugs in the anterior and posterior segments of the eye.

Keywords: Anterior segment, Barriers, Ocular bioavailability, Ocular drug delivery, Segments.

TELEPHARMACY

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Abstract

Telepharmacy is the delivery of pharmaceutical care via telecommunications to patients in locations where they may not have direct contact with a pharmacist. It is an instance of the wider phenomenon of telemedicine, as implemented in the field of pharmacy. Telepharmacy services include drug therapy monitoring, patient counselling, prior authorization and refill authorization for prescription drugs, and monitoring of formulary compliance with the aid of teleconferencing or videoconferencing. Remote dispensing of medications by automated packaging and labelling systems can also be thought of as an instance of telepharmacy. Telepharmacy services can be delivered at retail pharmacy sites or through hospitals, nursing homes, or other medical care facilities. Primary appeal of telepharmacy is its potential to expand access to pharmacy care in smaller rural communities, some of which cannot support a full-time pharmacist or cannot easily recruit a pharmacist to reside in their region. Telepharmacy can potentially give patients in remote locations access to professional pharmacy care that could not be received locally, which can lower costs and improve patient safety through better patient counselling, drug administration monitoring, and compliance monitoring. Sharing of pharmacists between sites can also decrease costs in existing facilities, which might no longer need to employ a full-time pharmacist. Telepharmacy is a rapidly growing area of communication within pharmaceutical care delivery, especially in rural areas. Telepharmacy has been successfully implemented within community pharmacy settings through the creation of remote dispensing sites.

Keywords: Telepharmacy, Telemedicine, Teleconferencing.

BIOELECTRONIC MEDICINES

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Abstract

Bioelectronic medicine is the consolidation of molecular medicine, neuroscience, engineering, and computing to develop a device to diagnose and treat diseases. The mechanisms of Bioelectronic medicine for neural control of a biological process that underlie disease and the development of devices to modulate these specific neural circuits as therapy using electrons instead of drugs. Bioelectronic medicine has emerged at a convergent epicentre in health care, technology, and science. Bioelectronic medicine is a new way to treat disease. Today patients are treated by either drug, which can lead to a side effect or drive up costs, which can mask pain signals but they usually can't mask the central cause of disease. With the rapid rise in technology for the precision detection & modulation of electrical signalling patterns in the nervous system is a new class of treatment known as bioelectronic medicines. Specifically, the peripheral nervous system will be at the centre of this advance, as the functions it controls in chronic disease are extensive. The vision for bioelectronic medicine is one of the tiny, implantable devices that can be attached to individual peripheral nerves. Such devices will be able to decipher & modulate neural signalling patterns, achieving therapeutic effects that are targeted at signal function of a specific organ. This new field was exploring the potential to treat Paralysis, Diabetes mellitus, Rheumatoid arthritis, chronic disease, Hypertension, blind diseases, etc.

Keywords: Bioelectronic medicine, Neuroscience, Peripheral nervous system.

HERBAL EXTRACT LOADED NANOSPONGE BASED ALOE VERA GEL FOR ALOPECIA AREATA

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Abstract

Alopecia Areata is an autoimmune disorder characterized by chronic hair loss. AA can manifest in a variety of patterns, from well-defined patches of scalp to the worst, irreversible, complete skin and body hair loss. Traditional drug delivery systems that include lotions, ointments, patches and creams are associated with many barriers such as limited drug load performance and poor penetration. In addition, they can adhere to a slightly diffuse coefficient, so they need to be applied frequently, leading to patient suffering. Proper delivery is essential for targeting hair follicle, maximizing therapeutic effects and minimizing unwanted side effects due to systemic absorption. Nanosponges are porous polymeric delivery systems that are small spherical particles with large porous surfaces like sponges with a size about virus (250nm-1μm). They has emerged as an effective alternative method for targeting the drugs directly into hair follicles, and by modifying the drug release profile, which altogether leads to the improvement of drug efficacy, safety and patient compliance. Many active ingredients of synthetic origin are available for treatment; however, they have a number of limitations. This has increased interest in finding an alternative approach against hair loss using preparations containing plants and/or their isolated active ingredients. The plants with the most evidence based effect against alopecia areata are Curcuma aeruginosa, Piper nigrum, Serenoa repens (palmetto), green tea, fenugreek and Chinese red ginseng. The assumed mechanism of action is predominately inhibition of 5á-reductase enzyme, with enhanced nutritional support and scalp blood circulation playing a role as well. Aloe vera is used worldwide now a day for its nutrtional and moisturizing properities. A number of beneficial effects of Aloe Vera have been reported, including immune-modulator, wound and burn healing, antifungal, and anti-inflammatory properties. It can serve as an excellent base for the preparation of gel.

Keywords: Alopecia Areata, Nanosponges, herbal extracts, 5á-reductase inhibitors, Aloe vera gel.

FAST-DISSOLVING TABLETS: UPDATES

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Abstract

A new concept in oral delivery is fast dissolving tablets (FDTs) are widely accepted nowadays. Fast dissolving tablets (FDTs) have received ever-increasing demand during the last decade, and the field has become a rapidly growing area in the pharmaceutical industry. Fast dissolving Tablets are disintegrating and/or dissolve rapidly in the saliva without the need for water. Such tablets readily dissolve or disintegrate in the saliva generally within. FDTs, also known as orally disintegrating tablets, are advantageous, especially for elderly and paediatric patients who have trouble swallowing standard tablets and capsules. In some case such as motion sickness, sudden episodes of allergic attack or coughing, and an unavailability of water, swallowing conventional tablets may be difficult. In particular, FDT technologies based on lyophilization, molding, sublimation, and compaction, as well as approaches to enhancing the FDT properties, such as spray drying and use of disintegrants.

Keywords: FDTs, Disintegrates, Orally, Saliva.

NOVEL DRUG DELIVERY SYSTEM LIQUISOLID TECHNOLOGY

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Abstract

Liquisolid technology is also referred to as powder solution technology and is the approach that deals with the principle of solubility. A novel "powder solution process," which uses liquid drugs, admixes with the required carriers and coating material, which is formed into free-flowing, dry-looking, non-stick and compressible types of powder. Liquidsolid technology mainly used for enhanced the dissolution rate. In comparison with a conventional marketed product, higher rate of dissolution was found in all powder solution technology. The compacts of Liquisolids are manufactured using low volatile oils to produced liquid medicines like oily liquid drugs, poor water soluble drugs, solutions or suspensions. The main advantages of this method are low costs, easy manufacturing and large potential for industrial production. Liquisolid technology was also studied in order to reduce the effect of pH variation on medicament release as a promising alternative for improving photostabilities in solid formulations as compared to conventional coating. Overall, liquisolid technique is a newly designed for increase drug dissolution and sustaining drug release.

Keywords: bioavailability, liquisolid, water soluble, drug delivery system.

NANOPARTICULATE DRUG DELIVERY IN MITIGATION OF CANCER

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Abstract

Nanoparticles are being developed and rapidly tested to overcome some of the shortcomings of conventional drug delivery methods and are emerging as unique therapies for cancer treatment. Conventional chemotherapeutics have some serious side effects, such as damage to the immune system and damage to other organs from rapidly proliferating cells, poor targeting, lack of solubility, and inability to reach the root of the tumor, leading to poor treatment with low doses. and low survival rates. Hybrid nanoparticle technology, which combines the capabilities of different nanoparticles, has advanced this type of drug-carrying system to a new level. Novel nanoscale targeting technology may offer new hope for cancer patients as a result of developments in materials science and protein engineering. Several therapeutic nanocarriers have been authorized for use in clinical settings. Nanoparticles have been engineered for ideal size and surface properties to increase their circulation time in the bloodstream, thereby improving the bioavailability of cancer drugs. In addition, they are able to exploit the distinct pathophysiology of tumours, such as their increased permeability and retention effects, to deliver their loaded active drugs to cancer cells and the tumor microenvironment. With improved drug localization and cellular uptake, nanotechnology has made it possible to directly target malignant cells. Nanoparticles can be engineered to recognize malignant cells and deliver drugs with precision and selectivity while avoiding contact with healthy cells. In addition, studies are being conducted to determine whether various therapeutic drugs and/or diagnostic substances can be delivered via nanoparticles to enable combination therapy. It focuses on how nanoparticles deliver personalized drugs to cells, publishes numerous breakthrough studies and reduces the adverse effects of conventional drugs, including customized cancer therapies, and describes a targeted strategy for nanoparticle-based drug delivery.

Keywords: Drug delivery, Drug resistance, Hybrid nanoparticles, Nanoparticles.

3D PRINTING OF PHARMACEUTICALS

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Abstract

Three dimensional printing is revolutionary technique that uses computer aided design software and programming to create three dimensional objects by placing material on a substrate. 3D printing is an additive layer manufacturing technique, where consecutive layers are deposited or solidified to form a 3D structure. 3D printing involves the production of structures with desired design by layer fasion. It permits on demand fabrication of structures with high productivity economically. The different 3D printing techniques has been developing and developed to fabricate novel solid dosage form. Which are among the most well known and discrete products today. Currently, it is employed in wide range of healthcare services such as drug formulation medical devices, anatomical models, and dentistry. 3D printing can include very new possibilities to optimized medicine. The primary objective of this project to describe various approaches in personalised medicine,progress in dosage forms and devices, 3D printing techniques, use of polymers in 3D printing adaptation of 3D in pharmaceutical industries. The current project is an effort of briefing various methods, advantages, disadvantages, applications of 3D printing in pharmaceutical technology.

Keywords: Three-dimensional printing, Structure, Print, Laser, Pharmaceutical Drugs.

FLOATING DRUG DELIVERY SYSTEMS

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Abstract

Floating drug delivery systems is one of the important approaches to achieve gastric retention to obtain sufficient drug bioavailability. This delivery system is desirable for drugs with an absorption window in the stomach or in the upper small intestine. Floating drug delivery system helps to improve the buoyancy property of the drug over the gastric fluids and hence maintain the longer duration of action. It is helpful in minimizing the dosing frequency. The density of dosage form must be less than the density of gastric contents (1.004 gm. /ml) in FDDS so, remain buoyant in the stomach without affecting gastric emptying rate for a prolonged period and the drug is released slowly as a desired rate from the system. After release of drug, the residual system is emptied from the stomach, this result in an increased in gastric retention time and a better control of the fluctuation in plasma drug concentration. It may effervescent or non-effervescent system or Raft forming (in situ gel formation) system. Its main focus is on the recent literature with special focus on classification, method of preparation, mechanism of action advantages and disadvantages.

Keywords: Floating drug delivery system, Effervescent system, Non- Effervescent system, Raft forming system.

ACTIVATED MODULATED DRUG DELIVERY SYSTEMS

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Abstract

Conventional therapeutic system has often been criticized for the toxicity associated with the drugs. Several issues like difficulty to access the target, enzymatic attack, limited drug solubility, and bioavailability, and poor tissue permeability make the effective drug delivery challenging. To minimize these drawbacks, many researchers have focused attention towards developing modulated drug delivery systems. So, modulated drug delivery system has been developed to overcome the limitations of the conventional drug delivery system. It is one of the approaches to design controlled release formulation. This system provides uniform concentration of drug to the absorption site and thus allows the maintenance of plasma concentration within the therapeutic range which minimizes not only side effects but also frequency of administration. In this system the drug release is controlled or activated by some physical, chemical and biological process or by any supplied external energy source. The physical processes that control drug release from activated modulated drug delivery system are: Osmotic process activated DDS, Hydrodynamic pressure activated DDS, Magnetically Activated DDS, Thermally Activated DDS, Photo Activated DDS, Mechanically Activated DDS, Sonophorosis Activated DDS, Electrically Activated DDS etc. The chemical processes that control drug release from activated modulated drug delivery system are: PH-Activated system, Ion Activated DDS, Hydrolysis Activated DDS and Chelation Activated DDS. Activation by biological processes are: Enzyme Activated DDS, Antibody Interaction Activated DDS, Antigen Activated DDS and Inflammation Activated DDS.

Keywords: Activated modulated drug delivery system, controlled release formulation.

RECENT UPDATES ON TRANSDERMAL DRUG DELIVERY SYSTEMS

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Abstract

Transdermal drug delivery system also known as 'patches'. These are dosage forms made to evenly distribute a therapeutic dose of medication across the skin of a patient. The effectiveness of 74% of the medications used orally nowadays is judged to be subpar. While a relatively large portion of the drug is carried into the systemic blood circulation, transdermal drug delivery systems are dosage forms that entail drug transfer to the epidermal and dermal tissue of the skin for local therapeutic benefit. The United States Food and Drug Administration (FDA) has received multiple reports of adhesion deficiencies for transdermal drug delivery systems through the drug quality reporting system (DQRS). Transdermal drug delivery has several key benefits, including limiting hepatic first pass metabolism, improving therapeutic effectiveness, and maintaining a constant plasma level of the drug. The characterization of transdermal patches is used to examine their consistency, uniformity, adhesiveness, quality and size, time of onset and duration, and moisture content. Transdermal drug delivery has a number of benefits, including limiting hepatic first pass metabolism, improving therapeutic effectiveness, and maintaining a constant plasma level of the drug. The management of pain, angina pectoris, smoking cessation, hormone replacement therapy, and neurological illnesses including Parkinson disease are just a few of the transdermal medicines and applications that are available.

Keywords: Transdermal drug delivery system; Transdermal system; Drug delivery; Patch; Adhesion.

RECENT ADVANCEMENTS: TARGETED DRUG DELIVERY SYSTEMS

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Abstract

Targeted drug delivery is an advanced method of delivering drugs to the patients in such a targeted sequences that increases the concentration of delivered drug to the targeted body part of interest only (organs/tissues/ cells) which in turn improves efficacy of treatment by reducing side effects of drug administration. Basically, targeted drug delivery is to assist the drug molecule to reach preferably to the desired site. Targeted drug delivery systems (TDDS) is emerging as a powerful tool for the treatment of cancer because of enhanced delivery of drugs, as well as genes, to a tumor site with protection from the extracellular environment. Nanogels (NG's) are three-dimensional hydrophilic polymer networks that are formed via covalent linkages or self-assembly processes and are able to change their structural properties in the presence of external stimuli. Targeted therapy is a type of cancer treatment that uses drugs designed to "target" cancer cells without affecting normal cells. Cancer cells typically have changes in their genes that make them different from normal cells. Genes are part of a cell's DNA that tell the cell to do certain things. When a cell has certain gene changes, it doesn't behave like a normal cell. For example, gene changes in cancer cells might allow the cell to grow and divide very quickly. These types of changes are what make it a cancer cell. But there are many different types of cancer, and not all cancer cells are the same. For example, colon cancer and breast cancer cells have different gene changes that help them grow and/or spread. Even among different people with the same general type of cancer (such as colon cancer), the cancer cells can have different gene changes, making one person's specific type of colon cancer different from another person's. Researchers have also learned that the environment in which different cancers start, grow, and thrive are not always the same. For example, some cancers have certain types of proteins or enzymes send certain messages to tell the cancer cell to grow and copy itself. Knowing these details has led to the development of drugs that can "target" these proteins or enzymes and block the messages being sent. Targeted drugs can block or turn off signals that make cancer cells grow, or can signal the cancer cells to destroy themselves. Targeted therapy is an important type of cancer treatment, and researchers will develop more targeted drugs as they learn more about specific changes in cancer cells but so far, only a few type of cancers are routinely treated using only these drugs. Most people getting targeted therapy also need surgery, chemotherapy, radiation therapy, or hormone therapy. The action of the drugs can affect where these drugs work and what side effects they cause. It is important to note that some targeted therapy drugs, for example, monoclonal antibodies, work in more than one way to control cancer cells and may also be considered immunotherapy because they boost the immune system. Passive targeting: Passive targeting is achieved by incorporating the therapeutic agent into a macromolecule or nanoparticle that passively reaches the target organ. In passive targeting, the drug's success is directly related to circulation time. Active targeting of drug-loaded nanoparticles enhances the effects of passive targeting to make the nanoparticle more specific to a target site. There are several ways that active targeting can be accomplished. One way to actively target solely diseased tissue in the body is to know the nature of a receptor on the cell for which the drug will be targeted. Treat Cardiovascular, Treat Diabetes, Treat Cancerous Tumors.

Keywords: Cancer treatment, Novel Drug Delivery Systems, Targeted Drug Delivery Systems.

FORMULATION AND EVALUATION ASPECTS OF HERBAL LOTION

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Abstract

The herbal cosmetics are those when natural herbs and their products used for their aromatic value in cosmetic preparation among consumers for herbal products triggered the demand for natural products and natural extracts in cosmetics preparations. Lotions are liquid preparations meant for external application without friction. They are applied directly to skin with the help of some absorbent material, such as, cotton wool or gauze soaked in it. Formulation of aloe vera lotion, formulation of menthol lotion and aloe vera lotion with arrow root powder is prepared using different composition. These formulations were evaluated with different evaluation parameters like Homogeneity, Appearance, after feel, Acid Value, pH measurement, Irritancy test, Viscosity, accelerated stability testing, Subjective Properties, spread ability, Type of emulsion test, sensitivity test, washability test, statistical analysis, In-vitro permeation studies, test for thermal stability, determination of total fatty matter, determination of water content, patch test. The objective of this abstract is to present the information of different herbal formulations of lotion and its evaluation. A modest investment in prevention produced substantial savings in illness-related costs. The FDA recently released its final orders concerning the labeling of lotion. The final monograph updates the tentative final monograph regarding over the counter (OTC) lotion products. Among the labeling standards are removals of the term “sun block" inclusion of a statement detailing the importance of sunscreen to prevent harmful effects of the sun, three sun protection categories: minimum, moderate, high, a new SPF category of 30+ for products with SPF values greater than 30, uniform, and streamlined labeling for all lotion.

Keyword: Herbal Cosmetic, Herbal Lotion, Aloe Vera, pH, irritancy.

CALOTROPIS GIGANTEA: INDIAN TRADITIONAL MEDICNAL PLANT

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Abstract

Plants utilised in traditional medicine are a treasure trove of novel bioactive compounds. Calotropis gigantea is an essential plant in traditional medicine that can be found all over the world. Plants utilised in traditional medicine are a treasure trove of novel bioactive compounds. Calotropis gigantea is an essential plant in traditional medicine that can be found all over the world. It has a smooth stem and round, light green leaves. The plant may grow naturally in a variety of soils and environments and doesn’t require any special gardening techniques one of the most significant subgroups of active chemicals in plant are terpenoids or terpenes. The current study documents the terpenpoids in calotropis gigantean and theirs seasonal changes. Numerous pharmacological effects have been described, including anti-inflammatory, analgesic, insecticidal, wound healing, anti-malarial, antimicrobial, cytotoxic, antipyretic, anti-asthmatic, anti-inflammatory, analgesic, and anti-diarrheal effects. These effects assist to treat covid -19.

Keywords: Calotropis gigantean, traditional medicine, bioactive compounds, pharmacological activity.

RECENT ADVANCEMENT IN TRANSDERMAL DRUG DELIVERY SYSTEM

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Abstract

Transdermal Drug Delivery System is prolonged method for drug delivery through the skin. It is because the skin offers a convenient and safer for the administration of the medication. It used to be promoting healing in the injured area of the body. TDDS includes a sustained release of the medication into the patient, it enables a steady the blood profile, it can result in reducing side-effect, and it can also increase the efficacy of the dosage. Transdermal drug delivery system has a low rejection rate, excellence efficacy of administration and persistence among the patient. TDDS is not only applicable in pharmaceutical and it is can be in applicable in skin care industry like cosmetic. Transdermal drug delivery uses the transdermal patches to admit drug through the skin. A transdermal patch is a medicated drug adhesive patch; it is placed on the skin to deliver the drug of a specific amount of dose of medication. Because this method mainly involves local administration, it can prevent local build up in drug concentration and nonspecific delivery to tissues not targeted by the drug. However, the physicochemical properties of the skin translate to multiple obstacles and restrictions in transdermal delivery, with numerous investigations conducted to overcome these bottlenecks. In this review, we describe the different types of available TDDS methods, along with a critical discussion of the specific advantages and disadvantages, characterization methods, and potential of each method. Progress in research on these alternative methods has established the high efficiency inherent to TDDS, which is expected to find applications in a wide range of fields.

Keywords: TDDS, Transdermal patches, medicated drug, skin.

RECENT ADVANCEMENTS IN CONTROLLED DRUG DELIVERY SYSTEMS : AN OUTBREAK

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Abstract

The goal of any controlled drug delivery system is to ensure patient safety while also improving drug effectiveness and patient compliance. A controlled release system is any delivery system that achieves slow drug release over a long period of time. This is accomplished through improved control of plasma drug levels and less frequent dosing. Maintaining drug concentrations in plasma within the therapeutic index is critical for effective treatment. These factors, along with others like repetitive dosing and unpredictable absorption, give rise to the idea of oral controlled release drug delivery systems. Controlled release drug delivery systems use a variety of mechanisms to regulate drug release rates. As formulation approaches, various mechanisms such as osmotic pressure, matrix system, reservoir system, altered density system, and so on have been used. The rationalization for the development of controlled release drug delivery system of a drug is to improve its therapeutic benefits, minimizing its side effects even as improving the management of the diseased condition.

Keywords: CDDS, Plasma, Slow Release.

RECENT ADVANCEMENTS IN VACCINE EMBEDDED DRUG DELIVERY SYSTEMS

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Abstract

Vaccines against viral disease have traditionally relied on attenuated virus strains or inactivation of infectious virus. Subunit vaccines based on viral proteins expressed in heterologous systems have been effective for some pathogens, but have often suffered from poor immunogenicity due to incorrect protein folding or modification. In this project, a focus on a specific class of viral subunit vaccine that mimics the overall structure of virus particles and thus preserves the native antigenic conformation of the immunogenic proteins. These virus-like particles (VLPs) have been produced for a wide range of taxonomically and structurally distinct viruses, and have unique advantages in terms of safety and immunogenicity over previous approaches. With new VLP vaccines for papillomavirus beginning to reach the market place. We argue that this technology has now " come – of – age " and must be considered a viable vaccine strategy. The utility of biodegradable and biocompatible microspheres as a vaccine delivery system for the induction of systemic and disseminated mucosal antibody responses was investigated. Intraperitoneal (ip) injection into mice of 1–10 ìm microspheres, constructed of the copolymer poly(DL-lactide-co-glycolide) (DL-PLG) which contained approximately 1% by weight a formalinized toxoid vaccine of staphylococcal enterotoxin B (SEB), dramatically potentiated the circulating IgG anti-toxin antibody response as compared to the free toxoid. The initiation of vaccine release was delayed in larger microspheres, and a mixture of 1–10 and 20–50 ìm microspheres stimulated both a primary and an anamnestic secondary anti-toxin response following a single injection. However, neither free nor microencapsulated SEB toxoid induced a detectable mucosal IgA anti-toxin response following systemic injection. In contrast, three peroral immunizations with toxoid-microspheres stimulated circulating IgM, IgG and IgA anti-toxin antibodies and a concurrent mucosal IgA response in saliva, gut washings and lung washings. Systemic immunization with microencapsulated toxoid primed for the induction of disseminated mucosal IgA responses by subsequent oral or intratracheal (it) boosting in microspheres, while soluble toxoid was ineffective at boosting. These results indicate that biodegradable and biocompatible microspheres represent an adjuvant system with potentially widespread application in the induction of both circulating and mucosal immunity.

Keywords: Vaccine, Delivery system, Virus.

ENHANCEMENT OF ORAL BIOAVAILABILITY OF POORLY WATER SOLUBLE CARVEDILOL DRUG BY SOLID DISPERSION METHOD

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Abstract

A major role in enhancement of oral bioavailability of poorly water soluble drug of anti-hypertensive is important and a very hard task in the development of such drug. Carvedilol, a potential beta-blocker hydrophobic drug that exhibit limited therapeutic effect through oral conventional drug delivery systems. As per BCS the drugs are classifying on their aqueous solubility and intestinal permeability. In the present study, it was aimed to develop inert matrix in

the solid stage by solid dispersion technique to achieve an increased dissolution rate or sustained release of drug by altering solid state properties with maintained drug stability. In solid dispersion technique fusion process is technically less difficult method of preparing the dispersion. Various solid dispersions with different ratios of Gelucire 44/14 and Carvedilol were prepared by fusion solvent method. Gelucire 40/14, Vitamin ETPGS, Amorphous fumed silica and Micro crystalline cellulose were used in the current methodology, Solid dispersion is a dispersion of drug in amorphous polymer matrix where the drug is preferably in the molecularly dispersed state.

Keywords: Antihypertensive, Carvedilol, Solid Dispersion, Fusion method.

BIOTECHNOLOGY IN DRUG DISCOVERY

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Abstract

New biotechnology and drug discovery technologies are facilitating the rapid expansion of the clinical drug chest, empowering with better understanding of disease. Biotechnology is introducing new capabilities to drug discovery which were considered until recently to be impractical and futuristic. Important research tool and themes include geomatics, proteomics, liquid – receptor interaction single transduction, rational drug design. Clinicians who use novel treatment must become familiar with these trends. Biotechnology was synonymous the emerging recombinant DNA technology and used for the large scale production of proteins. Emerging drug classes include monoclonal antibodies, Cancer vaccines, gene therapy, antisense standards, enzymes and protein. Drug delivery is become whole interdisciplinary and independent field of research and gaining the attention of pharmaceutical drug development, medical doctor and industry. Biotechnology has produced more than 200 new therapies and vaccines, including product to treat cancer, diabetes HIV/AIDS and autoimmune disorders. Biotechnology helps the pharmaceutical industry to develop new product, new processes, method and services and to improve existing ones. It becomes an important tool in pharmaceutical drug research and development.

Keywords: Biotechnology, Drug classes, Drug development.

NANODIAMONDS: SYNTHESIS, PROPERTIES, AND APPLICATION IN NANOMEDICINE

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Abstract

With the rapid development of nano science and nano technology, a wide variety of nanomaterials have been synthesized and discovered. Diamond nanoparticles, or Nanodiamonds, have the most disparate origins. Nanodiamonds are novel nanosized carbon building blocks possessing varied fascinating mechanical, chemical, optical and biological properties, making them significant active moiety carriers for biomedical application. Nanodiamonds(NDs) have excellent mechanical and optical properties, large surface area, easy bioconjugation and high biocompatibility, which makes them especially appealing for various potential applications. To take advantage of nanodiamond potential in drug delivery, focus has to be laid on its purity, surface chemistry and other considerations which may directly or indirectly affect drug adsorption on nanodiamond and drug release in biological environment.In recent

years, NDs have received considerable attention in nanomedicine, and some noteworthy progress has been achieved. This topic summarizes the synthetic routes and unique properties of NDs. In addition, the recent progress of NDs in nanomedical applications, including bioimaging, drug delivery and biosensing, is also discussed.

Keywords: Nanotechnology, Nanoparticles, Nanodiamonds, Detonation.

JOURNEY OF A DRUG MOLECULE: FROM RESEARCH TO PATIENT

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Abstract

Drug discovery is a process which aims at identifying a compound therapeutically useful in curing and treating disease. This process involves identification of candidates, synthesis, characterization, validation, optimization, screening and assays for therapeutic efficacy. Once a compound has shown its significance in these investigations, it will initiate the process of drug development earlier to clinical trials. New drug development process must continue through several stages in order to make a medicine that is safe, effective, and has approved all regulatory requirements. One overall theme of or topic is that the process is sufficiently long, complex and expensive so that many biological targets must be considered for every new medicine ultimately approved for clinical use and new research tools may be needed to investigate each new target. From initial discovery to marketable medicine is a long, challenging task. It takes about 12-15 years from discovery to approved medicine and requires an investment of about US $ 1 billion. On an average, a million molecules screened but only a single is explored in late stage clinical trials and is finally made obtainable for patients.

Keywords: Lead optimization, Clinical trials, Target validation identification, New drug.

TRANSDERMAL PATCH: DESIGN AND CURRENT APPROACHES TO PAINLESS DRUG DELIVERY

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Abstract

Use of transdermal patches can evade many issues associated with oral delivery, such as first passhepatic metabolism. Enzymatic digestion attack, drug hydrolysis and degradation in acidic media, drug fluctuation and gastrointestinal irritation. This article reviews various transdermal patches available in the market, types, structural components , polymer role, and the required assessment tools. Although transdermal patches have medical applications for smoking cessation, pain relief, osteoporosis, contraception, advances in formulation development are ongoing to make transdermal patch capable of delivering more challenging drugs. Transdermal patches can be tailored and developed according to the physiochemical properties of active and inactive components and applicability for long term use. Therefore, a number of chemical approaches and physical techniques for transdermal patch development are under investigation.

Keywords: Adhesives, polymer matrix, skin formulation, transdermal drug delivery, transdermal patch.

NANOEMULSION: CONCEPT DEVELOPMENT AND APPLICATIONS IN DRUG DELIVERY

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Abstract

Nanoemulsion are biphasic dispersion of immiscible liquids: either water in oil (W/O) or oil in water (O/W) droplets stabilized by an amphiphilic surfactant. These comes across as ultrafine dispersions whose differential drug loading; viscoelastic as well as visual properties can cater to a wide range of functionalities including drug delivery. However there is still relatively narrow insight regarding development, manufacturing, fabrication and manipulation of nanoemulsions which primarily stems from the fact that conventional aspects of emulsion formation and stabilization only partially apply to nanoemulsions. This genera deficiency sets up the premise for current review. We attempt to explore varying intricacies, excipients , manufacturing techniques and their underlying principles, production conditions, structural dynamics, prevalent destabilization mechanisms, and drug delivery applications of nanoemulsions to spike interest of those contemplating a foray in this field.

Keywords: Clinical trials, Drug delivery, In-vivo fate, Nanoemulsion, Oral, Ostwald ripening, Parenteral.

ROLE OF HERBAL EXTRACTS IN THE MANAGEMENT OF THYROID DYSFUNCTION

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Abstract

Thyroid dysfunction occurs when there is abnormal production of thyroid hormones from thyroid gland. Excess production of thyroid hormone results in a condition known as hyperthyroidism. Insufficient hormone production leads to hypothyroidism. Numerous treatment strategies are available, the hormone replacement therapy, iodine therapy, surgery and/or anti-thyroid therapy depending upon the form of disorder and the available treatment approaches possess certain side effects including the loss of appetite, muscular weakness, hair fall etc. which encourage the search for more promising ones and the herbal approach can provide significant therapeutic effects in the clinical treatment of thyroid diseases Traditional medicine is still recognized as the preferred primary health care system in many rural communities, due to number of reasons including affordability and effectiveness. Globally, there is a shift towards traditional medicinal plants to avoid the side effects associated with the synthetic drugs. Various studies on herbal plant extracts have shown potent activity in regulating thyroid hormone corroborating their traditional uses and their ability to treat thyroid dysfunction. Herbal extracts like Ashwagandha, Ginger, Atriplex halimus, Black cumin, or Nigella sativa, Bunium incrassatum, Agarwood, Bugleweed, Turmeric and many more have shown potential therapeutic effects in the treatment of thyroid dysfunction. Therefore, there is need to subject herbal plants to further studies, by isolating active compounds which can be processed into new and potent medicines and the need to study their mechanisms of action.

Keywords: Thyroid dysfunction, hypothyroidism, hyperthyroidism, herbal approach, herbal Extracts.

AMELIORATION OF THYROID DISORDERS WITH THE HELP OF PLANT DERIVED PRODUCTS

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Abstract

Thyroid dysfunctions are the most common endocrine disorders and a major healthcare issue throughout the globe. There are 42 million cases of thyroid abnormalities in India alone, making them the most common endocrine condition in the world. The thyroid gland is located at the front of neck that secretes thyroxine (T4) and tri-iodothyronine (T3) that travels through the blood stream to orchestrate the basal metabolic rates, growth and development. The most common cause of thyroid disease are the imbalance in the level of the T3 and T4 in gland. Thyroid is mainly two type of disorder is the Hypothyroidism, Hyperthyroidism, Goitre and thyroid cancer is disease related to the thyroid gland. There are many conventional treatments for the thyroid disorder is the Anti-thyroid drugs, Radioactive iodine and thyroidectomy but the some drawbacks associated with the conventional treatment approaches is the related such as reduce WBC count, hematopoietic damage and disease remission etc. That is lead to calls upon for the need to explore alternative treatment strategies. There are need to fight against adverse drug events and compliance issues is forcing the scientists to look upon for traditional herbal medicinal approaches. The efficacy of different herbal medicines evidence that their usage for improving thyroid functions. There are the some herbal such as lemon balm, bugleweed, rosemary, brown seaweed, etc. show the anti-thyroid activity. The herbal medicine have more beneficial as compare to the conventional treatment, the herbal medicine is the economical, minimum side effect, prevent hepatic damage and renal damage as compare to other treatment. The herbal medicines are natural and relatively safe and can be used with less caution.

Keywords: Hyperthyroidism, Hypothyroidism, Thyroidectomy, Goitre.

LUMPY SKIN DISEASE (LSD): THREAT FOR LIFE

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Abstract

Lumpy skin disease, which is caused by lumpy skin disease viruses (LSDV) in cattle. LSDV is among the major health problem affecting the livestock industry of most African countries. Lumpy skin disease (LSD) is a highly infectious disease of cattle. A disease transmitted by direct and indirect contact with infected cattle. Skin lesions are the major source of infection. The disease is characterized by large fever, enlarged superficial lymph nodes and multiple nodules on the skin and mucous membranes (including those of the respiratory and gastrointestinal tracts). Fever occurs almost one week after infection by the virus. This initial fever may exceed 41 °C (106 °F) and persist for one week. At this time, all of the superficial lymph nodes become enlarged. . Thus susceptible hosts contract the virus mainly by mechanical means from hematophagous arthropods including biting flies, Mosquitoes and ticks. Transstadial and transovarial persistence in varies species of ticks is also possible. Following infection characteristic lumpy skin disease lesions may explode from 7 to 14 days post infection under experimental conditions whereas in natural cases, it takes 2 to 5 weeks. Lumpy skin disease is manifested by distinguish firm, circumscribed few (mild form) to multiple (severe form) skin nodules. Which sometimes involves mucous membrane of respiratory system, urogenital system and other internal organs .The disease often results in

chronic debility, reduced milk production, poor growth, infertility, abortion, and sometimes death. Therefore large scale vaccination combined with other appropriate control measures are the most effective way of limiting the spread and economic impact due to lumpy skin disease. This review is designed with the aim of providing latest information on the biology of lumpy skin disease virus, mechanism of spread , clinical and pathological features of lumpy skin disease.

Keywords: Lumpy Disease, Fever, Infection.

OMICRON : SARS COV-2 VARIANT

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Abstract

Recent emergence of the SARS-CoV-2 variant as OMICRON has become a global concern. This short note highlights the identification and global spread of OMICRON which has spread over 77 nations by now, which resulted in many hypotheses about its origin and degree of infectivity.Multifaceted approach including rapid diagnosis, genome analysis of emerging variants, ramping up of vaccination drives and receiving booster doses, efficacy testing of vaccines and immunotherapies against newly emerged variants, updating the available vaccines, designing of multivalent vaccines able to generate hybrid immunity, up-gradation of medical facilities and strict implementation of adequate prevention and control measures need to be given high priority to handle the on-going SARS-CoV-2 pandemic successfully.

Keywords: Omicron, Immunotherapies, SARS CoV-2.

ROLE OF MODERN MOLECULAR IMAGING IN DISEASE DIAGNOSIS

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Abstract

At the end of the 20th century, we saw the emergence of molecular imaging, an interdisciplinary technique. It combines in vivo imaging with molecular biology with the goal of non-invasively identifying living biological processes at the cellular and molecular level. The various advanced molecular imaging techniques are discussed in this article. These techniques are very valuable in the monitoring of structural, functional and molecular changes in disease affecting patients. In this article, we can discuss advantages, disadvantages of various molecular imaging techniques. To overcome the limitations of these molecular imaging techniques, the researchers integrate two or more detection tools to display vast information that is helpful in monitoring, diagnosis of disease and its treatment. These techniques have great importance in the early stage diagnosis of various tumors. Finally, we summarize the great challenges, the future development, and the great potential in this field.

Keywords: Molecular imaging, Tumors, In-vivo diagnosis.

TRANSLATION AND FACE VALIDATION OF MEDICAL OUTCOME OF STUDY (MOS) OF SF-36 QUESTIONNAIRE IN HINDI: A PILOT STUDY

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Abstract

Objective: Translation and face validation of SF-36 in Hindi is the objective of this study for the administration in field study for reliability and validity study of SF-36 in Hindi.

Methodology: For the translation procedure two forward translations were performed from English version to Hindi version of SF-36. Translated Hindi version of SF-36 is administered in 50 patients for the test of acceptability and reliability. Some items were changed due to sociocultural differences in India. Acceptability were analysed by low missing data in questionnaire and reliability were analysed for internal consistency. This study is approved by HREC of Geetanjali University with reference number of GU/HREC/EC/2022/2147.

Result: Total 50 patients were administered for face validation and acceptability and some words were changed for its adaptation in Hindi language. Out of 50 patients 35 were male and 15 were female. Low missing data were found only 2% data were found missing. Reliability test were performed of each domain found satisfactory above 0.7 (Cronbach's Alpha).

Conclusion: Acceptability and reliability of this translated version can be test for further field study.

Abbreviations: MOS: Medical Outcome of Study; SF-36: Short Form-36.

IMPACT OF COVID 19 (CORONA VIRUS)

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Abstract

COVID-19 was not the only recent pandemic. This posed the question, were similar disruptions and adaptations also seen in recent past pandemics such as Severe Acute Respiratory Syndrome (SARS) or Middle East Respiratory Syndrome (MERS) that could have prepared medical educators for COVID-19? This scoping review investigated the educational and personal impact of recent pandemics on medical students.COVID-19 is an infectious disease caused by severe acute respiratory syndrome Coronavirus 2 (SARS-CoV-2). It has been recognized as a pandemic by the World Health Organization (WHO) on 11 th March, 2020.This work predicts COVID-19 cases, the minimum and the maximum number of deaths due to COVID-19 in India based on the infection rate and suspected cases.

Keywords: COVID-19, Severe Acute Respiratory Syndrome(SARS), Middle East Respiratory Syndrome (MRS).

PATIENT COUNSELING

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Abstract

It is defined as medication instructions given to patients by pharmacists, either orally or in writing. It was initiated in 1979. Clinical pharmacy has risen rapidly in India. Education departments mentioned a subject called & quot; pharmacy practice & quot; for undergraduates (UG) and postgraduates (PG). Communication skills should be acceptable to both parties. The conversation involves both verbal and non-verbal communication. The primary objective behind patient counseling is to ensure the therapeutic use, adverse effects, dose amount, interval of dose, precautions, maintaining a healthy life, and improving understanding regarding the disease and its diagnosis. There are four steps involved in patient counseling that include interaction between pharmacist and patient, assessment of disease, provision of medication, visualization of models, and feedback. All patients, but especially the elderly, children, and new patients, must consult with a doctor. patient counseling away from any kind of distraction, and that should be confidential for the patient to convey his problem. The counseling content is complete with all medication knowledge and pin points, such as how to demonstrate drug action in the body, dose missing effect, drug interaction, therapeutic use, expected minimum duration of time to gain benefit, time interval of dose, and the end of all instruction. The pharmacist's first responsibility is to motivate the patient, give them a positive vibe, and provide a pathway for maintaining a good life. To overcome the pressure on doctors; responsibilities, that work is shifted to pharmacists so that they can explain prescriptions in 5-7 minutes. The main goal of patient counseling is to provide adequate information about medication use and precautions, as well as to motivate the patient during this difficult time.

Keywords: Patients, Disease, Pharmacist, Counseling.

BATCH MANUFACTURING RECORD

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Abstract

Good manufacturing practice requirements of premises, plant and equipment for products under drug and cosmetic act, 1940. Which is covered under rules 71, 74, 76, and 78. From issuance of new material to final packaging, our batch passes through various stages and batch manufacturing report is collection of this whole process which carries Name of product, Batch formula, brief manufacturing process, batch or code number, reports of date and time, equipments used, sampling, weight, bulk mass density, signature and seals of persons performing and directly supervising on each step in operation, in process and laboratory test results, final yield, packaging and labeling data. This all data is filled and verified by various departments like production, Quality control (QC), In Process Quality Control (IPQC) and finally by quality assurance (QA) department which review batch number, reports of raw material used, status of equipment used and significance in the process. After verification product is sent for dispatching. Record of BMR should save for five years from manufacturing. The complete history and methodology of the product are entered in this BMR to assure quality and safety of manufactured products for future convenience and also supports an organization's conduct in its business.

Keywords: Batch Manufacturing Report (BMR), Quality Assurance, Manufacturing.

MOLECULAR DOCKING: STUDY OF PHYTOCONSTITUENTS ON ALZHEIMER'S DISEASE

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Abstract

Alzheimer's disease is a progressive neurologic disorder that causes the brain to shrink and brain cells to die. Alzheimer's disease is the most common cause of dementia - a continuous decline in thinking, behavioral and social skills that affects a person's ability to function independently. The ultimate aim of Alzheimer's disease therapy is to stop or slow down the disease progression. Current synthetic therapeutics like cholinesterase inhibitors and NMDA receptor antagonist have a modest clinical effect on the symptoms and does not prevent the deterioration of dementia. It is the need of the hour to identify the underlying cause of the disease and to develop alternative approaches targeting multiple pathways of dementia and AD. Herbs may play a promising role in the early treatment of Alzheimer's and other conditions involving poor memory and dementia. One of the chief benefits is that they have less side effects and low toxicity as compared to pharmaceutical agents. Molecular docking is an established in silico structure-based method widely used in drug discovery. Molecular docking is an attractive scaffold to understand drug biomolecular interactions for the rational drug design and discovery, as well as in the mechanistic study by placing a molecule (ligand) into the preferred binding site of the target-specific region of the DNA/protein (receptor) to form a stable complex of potential efficacy and more specificity. The information obtained from the docking technique can be used to suggest the binding energy and stability of complexes. The binding energy of the drug-target interactions is important to describe how fit the drug binds to the target macromolecules.

Keywords: Molecular Docking, Alzheimer's Disease, Phytoconstituents, Drug Discovery, Dementia.

AN EYE ON COW URINE: BOON AS BIOENHANCER IN THE PHARMACEUTICAL AND AGRICULTURAL SECTOR

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Abstract

Presently, drug resistance among microorganisms spreads at a pace that it is becoming very difficult to treat various infections. It becomes a matter of concern as about 70% of pathogenic microorganisms become resistant to drugs that are used to treat diseases. These drugs have a large proportion of chemicals that have many side effects on our bodies. An idea is taken from Ayurveda to overcome this problem. Ayurveda contains the details of the use of cow products which are used for treating various health-related diseases as well as in the production of various pharmaceutical processes. A Cow is a sacred animal. Cow urine has the ability to regulate various immune functions. It is scientifically proven that it has antibiotic, antifungal, anti-cancer, and anti-diabetic properties and is also used as a bio enhancer for a good yield of plants. This review article provides information about how cow urine is used to treat various harmful diseases as well as in the agricultural field to enhance plant growth.

Keywords: Cow urine, Antibiotic, Antifungal, Anti-cancerous, Bioenhancer.

ROLE OF CADD IN DRUG DISCOVERY AND DEVELOPMENT PROCESS

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Abstract

The drug discovery and development process is very complex, slow, long, risky, and costly, and it takes 12–15 years to launch the drug on the market. Despite the huge investment of up to billions, there is a higher chance of drug failure at the later stages of drug development due to poor pharmacokinetics. Therefore, the computational tools and techniques not only reduce the cost of drug discovery but also assist in the development time. With the help of these computational or (in silico) tools, we can improve the pharmacokinetics of drugsand also prevent the deaths of unwanted animals. These approaches are emerging day by day dueto less chances of failure; and give more potent, selective and effective drug. CADD has twomain methods of drug design: structure-based drug design and ligand-based drug design. Boththese methods are very valuable in the discovery of a number of drugs. The CADD have also been very valuable in the discovery of COVID-19 medicines. In this article, we put some light on various softwares used in the drug discovery and development processes. We will also discuss about the success stories of CADD and challenges that are still remains to resolve.

Keywords: Drug discovery, PK, computational tools, ADMET, Virtual screening.

RECENT ADVANCEMENTS IN THE TREATMENT OF THYROID DISEASE

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Abstract

The thyroid hormone is well known for controlling metabolism, growth, and many other body functions.The main hormones produced by the thyroid gland are thyroxine or tetraiodothyronine (T4) and triiodothyronine (T3), Thyrotropin-releasing hormone (TRH) from the hypothalamus, thyroid-stimulating hormone (TSH) from the anterior pituitary gland, and T4 work in synchronous harmony to maintain proper feedback mechanism and homeostasis. There are four common issues associated with the thyroid including Hashimoto's thyroiditis, Graves' disease, goitre (enlarged thyroid) hyperthyroidism, hypothyroidism, autoimmune thyroiditis, and thyroid nodules. The common pathological condition of thyroid hormone deficiency and the most common symptoms in adults are fatigue, lethargy, cold intolerance, weight gain, constipation, change in voice, and dry skin, but clinical presentation can differ with age and sex, among other factors and the standard treatment is thyroid hormone replacement therapy with levothyroxine. Hyperthyroidism is characterised by increased thyroid hormone synthesis and secretion of the thyroid gland, whereas thyrotoxicosis refers to the clinical syndrome of excess circulating thyroid hormones, irrespective of the source.Antithyroid drugs such as propylthiouracil (PTU), methimazole (MMI), carbimazole, and levothyroxine (LT4) are commonly used drugs, however drug toxicity and long treatment periods encourage the search for more promising ones Hypothyroidism is characterized by failure of the thyroid gland to produce sufficient thyroid hormone to meet the metabolic demands of the body. Untreated hypothyroidism can contribute to hypertension, dyslipidaemia, infertility, cognitive impairment, and neuromuscular dysfunction Hypothyroidism may occur as a result of primary gland failure or insufficient thyroid gland stimulation by the hypothalamus or pituitary gland. Hypothyroidism mostly treated with thyroid hormone replacement therapy, and the most effective way to treat hypothyroidism is with synthetic T4 medication (levothyroxine).

Keywords: Thyroid Diseases, Hyperthyroidism, Hypothyroidism, Thyroid dysfunction

IN-VITRO ANTIOXIDANT AND THROMBOLYTIC ACTIVITIES OF METHANOLIC STEM EXTRACT OF ELATOSTEMA SESSILE

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Abstract

Objective: The purpose of this study was to cover the methanolic extract of Elatostema sessile stem and to terminate their Antioxidant and Thrombolytic activities.

Methods: Stem of Elatostema sessile was eradicated with pure methanol which was screened for antioxidant movement by using reducing power, total phenolic content (TPC) and total flavonoid contents (TFC). Thrombolytic activity was determined by the percentage of clot lysis.

Result: The reducing power of extract of Elatostema sessile stem was found remarkable and was observed that raise of activity gradually increases with the concentration of extract. The total phenolic contents (TPC) (36.56 mg GAE/g extract) were found moderate significant and the total flavonoid contents (TFC) (28.10 ± 0.37 mg QE/g extract) were also found moderately significant. At thrombolytic study, methanolic extract of Elatostema sessile stem showed 25.53% clot lysis while 75%and 4.66% clot lysis were obtained for positive control (streptokinase) and negative control (water) respectively. That shows moderate thrombolytic activity of methanolic extract of Elatostema sessile stem.

Conclusion: The methanolic extract of Elatostea sessile stem has moderate antioxidant activity and moderate thrombolytic effect. Thus its further pharmaceutical research and compound isolation is recommended.

Keywords: Elatostema sessile stem, methanolic extract, In-vitro antioxidant, Thrombolytic activity.

IPOMOEA CAIRICA: A MEDICINAL PLANT WITH POTENTIAL HEALTH ADVANTAGES

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Abstract

Ipomoea cairica is a medicinal plant belonging to family Convolvulaceae widely found in China and India. In the present era the herbal medicines are more beneficial as compare to the conventional and synthetic treatments and also have less adverse effects. Ipomoea cairica (L.) or Cairo morning glory shows various pharmacological effects due to presence of the various chemical constituents. The phytoconstituents present in this plant are alkaloid, flavonoid, cyanogenic glycoside, tannin, phytate, and saponin. The major constituents of the extract are coumarins, scopoletin and umbelliferone and the lignans, arctigenin, matairesinol and trachelogenin. Ipomoea cairica has a number of health benefits. Ipomoea cairica is used in treatment of various diseases. The plant has been used for fever, jaundice, biliousness, bronchitis, liver ailments, blood disease, sterility in women, urinary infection, constipation, gynecological disorder. Because of its antioxidant, anti-inflammatory, antibacterial, mosquito larvicidal, and other qualities, recent research support the idea that it can also be used to treat Japanese encephalitis. The objective of this study is to highlight the phytochemical, and pharmacological information of this plant.

Keywords: Ipomoea cairica, antimicrobial activity, antioxidant activity, Jaundice, Liver Complaints, Phytoconstituents.

ROLE OF HERBAL MEDICINE IN THE TREATMENT OF NEUROINFLAMMATION

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Abstract

Neuroinflammation is the inflammation of the nervous tissue. Inflammation in the brain is characterized by activation of glial cells (mainly microglia and astrocytes). Toxic metabolites, autoimmunity, aging, microbes, viruses, traumatic brain injury, air pollution, passive smoke are the major causes of neuroinflammation. Neuroinflammation has been associated with a variety of neurodegenerative diseases like Alzheimer's disease, Parkinson's disease. There is increasing interest to determine whether reducing inflammation will reverse neurodegeneration. Recent researches revealed that there are many compounds isolated from natural plants that can delay the neuronal damage and degenerative progression by inhibiting microglial activation, so they have attracted considerable attention as pharmacological intervention against neurodegenerative disorders with neuroinflammatory condition. Now, as increasing evidence indicates that neuroglia-derived chronic inflammatory responses play a pathological role in the central nervous system, anti-inflammatory herbal medicine and its constituents are being proved to be a potent neuroprotector against various brain pathologies. The use of herbal medicine, as one of the elements of complementary and alternative medicine, is increasing worldwide.

Keywords- Inflammation, Neuroinflammation, Herbal Medicine, Neuroprotection.

STRUCTURAL ANALYSIS OF FLAVONOID-SURFACTANT MICELLAR AGGREGATES BY FT-IR AND 1H-NMR SPECTROSCOPY

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Abstract

The spectroscopic analysis has been performed to study the structural changes associated with micelles formed from flavonoid-surfactant interactions. A fixed amount of flavonoid (quercetin and rutin) was dissolved in hydro-ethanolic solvents of different concentrations (aqueous, water rich, ethanol rich and absolute ethanol). The surfactants were added to the solution until micelle formation occurs. The formation of micelles was confirmed by conductometric and surface tension studies so as to determine critical micelle concentration. The FT-IR and 1H-NMR spectroscopic techniques were used to compare individual structures of flavonoid and surfactants with structure of micellar aggregates. This study helped in determining the locus of quercetin and rutin within micellar structure of surfactants via obtained chemical shifts in the spectrum. In addition, the physical assessment by spectroscopic evaluation also confirmed the nature of intermolecular interactions within the micellar system. The study has been performed on flavonoids and different categories of surfactants (i.e. anionic, cationic and non-ionic). This analysis further supported our previously performed physico-chemical experimental studies and will be utilized in developing a novel topical formulation in our ongoing project.

Keywords: Spectroscopy, Surfactants, Flavonoids, Micelles, Interactions, Formulations.

ADMINISTRATION OF COSTUS IGNEUS NAK LEAF EXTRACT IMPROVES DIABETIC-INDUCED IMPAIRMENT OF RAT HEPATORENAL FUNCTIONS

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Abstract

Objectives: The present study was designed to evaluate the therapeutic efficacy Costus igneus Nak. leaf extract diabetes-induced hepatorenal injury in rats.

Methods: Diabetes was induced in male albino rats by administering single injection streptozotocin (55mg/kg) for one day. The diabetic condition was established by estimation of blood glucose level; animals with blood glucose levels above 250 mg were considered as diabetic. Following the confirmation, animals were randomly divided into seven experimental groups, viz group I served as the control, group II diabetic, group III- CI (300mg/kg), group IV-diabetic+CI (100mg/kg), group V-diabetic+CI (200mg/kg), group VI- (CI 300mg/kg) and group VII-diabetic+glibenclamide. Treatment regimens were started 24h after the confirmation of the successful induction of diabetes and continued for four consecutive weeks at three doses (100-300mg/kg) for 4 weeks. after the completion of experimental period animals were sacrificed blood was collected through retro-orbital puncture for separation of serum for assessment of liver (ALT, AST, ALP, albumin, globulin and bilirubin) and kidney-specific biomarkers (creatinine, urea, and uric acid, Na + and K +), and inflammatory cytokines (TNF-?, IL-6, IL-1?, TGF-?1, IL-10. Liver and kidneys were harvested for histopathology and biochemical screening. Hepatorenal protective activity was evaluated by estimating different biochemical variables and histopathology by hematoxylin and eosin staining of the liver and kidney tissues.

Results and Conclusions: Three different daily doses of the plant extract showed recovery in all the biochemical parameters such as lipid peroxidation, reduced glutathione, superoxide dismutase, catalase, glucose-6-phosphate dehydrogenase, glutathione reductase, glutathione peroxidase, and glutathione-S-transferase; ALT, AST, and ALP; creatinine, urea, and uric acid; total cellular protein content in tissues, glycogen content, and serum protein content (albumin and globulin); and inflammatory cytokines. However, significantly higher recovery was observed in the 300mg/kg dose treated group of animals. Considerations of the serological, biochemical and histopathological studies, it may be concluded that that the C. igneus Nak. leaf extract abolished various deleterious effects of type 1 diabetes on rat hepatorenal function.

Keywords: Diabetes, Liver, Kidney, Herbal medicine, Oxidative stress, Streptozotocin

ADVANCED SPECTRAL ANALYTICAL TECHNIQUES: A BOON FOR PHARMACEUTICAL INDUSTRY

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Abstract

The techniques of adulteration are getting advanced with the passage of time and this too applies when it comes to the pharmaceuticals. Nowadays market is flooded with duped pharmaceutical products. To regulate proper quality control in pharmaceutical industry to prevent the counterfeit medicines which is still a big issue in the whole world. So, pharmaceutical industries are emphasizing more on advanced technologies for keeping a proper check on quality of the pharmaceutical products. Spectral technique is emerging field of science, which usually prefers

on its characteristics like rapid results, non-destructive in nature and non- invasive method. The spectral information which helps in formulating the chemical images of pharmaceutical products provides the quantitative and qualitative details of the sample. The process of a drug molecule from the laboratory to the market has undergone through various stages to ensure the quality of the product. The application of IR, FTIR, and RAMAN spectroscopic techniques used for quality control and quality assurance of the pharmaceutical products is envisaged. An overview of various developments of analytical methodology will be presented.

Keywords: Quality control, Pharmaceuticals, Chemometrics, Raman spectroscopy, FTIR Spectroscopy. Quality control, Pharmaceuticals, Chemometrics, Raman spectroscopy, FTIR Spectroscopy.

PLEIOTROPIC POTENTIAL OF SILIBININ

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Abstract

A mixture of flavonolignans consisting of silibinin, isosilibinin, silicristin, silidianin, and others. Silybin A and silybin B are two diastereomers, which are the mixtures of silibinin. This mixture have their pharmacological effects mainly in liver. Silibinin traditionally been used for the treatment of liver disease. Now a days silibinin used as clinically and silibinin have potential clinical value in the treatment of liver disorder, mushroom poisoning, neurodegenerative, diabetes mellitus, neurotoxic disease, numerous forms of cancer and certain types of nephrotoxicity. The flavonoid silibinin used as a nephroprotectant in the current studies. This review shows the current information of the use of silibinin/silymarin in cancer treatment and also suggests directions for new areas of research which offer a more comprehensive approach to investigation of the drug.

Keywords: silibinin; nephrotoxicity; milk thistle; cancer; nephroprotectant

PREPARATION OF ALOE VERA COSMETIC HERBAL HYDROGEL

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Abstract

Aloe vera (AV) is a perennial, drought-resisting, succulent plant belonging to the Liliaceae family and historically, has been used for a variety of medicinal purposes. The leaves which are lance-shaped with sharp points contain an essentially clear viscous gel known as aloe vera gel (AVG). The present study was conducted to formulate a suitable AV cosmetic herbal hydrogel formulation. The aloe vera cosmetic herbal hydrogel have been formulated using inner part of aloe vera leaf, acacia, hydroxy propyl methyl cellulose (HPMC), carbopol 934, glycerine, tartaric acid, potassium sorbate and sodium benzoate. Aloe vera gel was prepared by heating at low temperature and the hydrogel was prepared by simple dissolving method of other ingredients in a specific manner. The formulation was evaluated for percentage moisture content, transparency, smoothness, weight on drying, viscosity and pH. The present study showed smooth and effective formulation. Therefore, on the basis of evaluation of AVG, it can be used for cosmetic purpose as herbal preparation.

Keywords: AVG, HPMC, Hydrogel.

CLINICAL RESEARCH & PHARMACOVIGILANCE

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Abstract

Clinical Research is a branch of healthcare science that determines the safety and effectiveness of medications, devices, diagnostic product and treatment regimens intended for human use, these may be used for prevention, treatment, diagnosis or for relieving symptoms of a disease. Pharmacovigilance supports safe and appropriate use of drugs. Spontaneous reporting of adverse drug reactions (ADRs) is an essential component of pharmacovigilance. However, there is significant underreporting of ADRs. Adverse drug reactions have become a major problem in developing countries. Knowledge of pharmacovigilance could form the basis for interventions aimed at improving reporting rates and decreasing ADRs. Pharmacovigilance has been described as "the science and activities relating to the detection, assessment, understanding and prevention of the adverse effect of drugs or any other possible drug-related problems. it is a fundamental component of effective drug regulation systems, public health programmes and Clinical practice".

Keywords: - ADRs, Adverse Drug Reactions, Drug, Pharmacovigilance, Clinical Research

THYROID ASSOCIATED GYNECOLOGICAL PROBLEMS

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Abstract

Thyroid dysfunction are increasingly recognized as risk factors for public. From different different studies we found that now days the thyroid disease is very common in world. In world 75% people suffers from this disease. Bt here we are talking specially about thyroid associated gynecological problems mainly pregnancy. There is a lot of problems affected by thyroid in women like pregnancy, menstrual cycle etc. Thyroid disease in pregnancy can affect the health of the mother as well as the child before and after delivery. Main focus of this study is to treat this disease very carefully because untreated or less treated thyroid disease can affect new generation or we can say new baby. An underactive thyroid causes every function of the body to slow down, such as heart rate, brain function, and the rate your body turns food into energy. Hashimoto's disease is the most common cause of an underactive thyroid. It is closely related to Graves disease, another autoimmune disease affecting the thyroid. Diagnosis can often be made through laboratory tests. The first is TSH, which is generally below normal in hyperthyroidism and above normal in hypothyroidism If you have thyroid problems, you can still have a healthy pregnancy and protect your baby's health by having regular thyroid function tests and taking any medicines that your doctor prescribes.

Keywords: thyroid, Hashimoto's disease, autoimmune disease, TSH

GREEN TEA VS PHARMACOLOGY

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Abstract

Green Tea (GT) belongs to family *Theaceae* and it is one of the best antioxidant plants having medicinal uses against free radical induced diseases. . Numerous health-promoting functions of green tea contain epigallo-catechin gallate (EGCG) (a major active component of green tea), included anti-oxidant, anti-inflammatory, anti-atherogenic, and anti-cancer effects have been demonstrated. Green tea extract (GTE) inhibited various nephrotoxic intracellular signal transduction pathways mediated by NF- B, epidermal growth factor êB, epidermal growth factor ê receptor (EGFR), insulin-like growth factor-I (IGF-I) and mitogen-activated protein kinases (MAPKs). GTE reduced the cytokine-induced generation of reactive oxygen species (ROS), the loss of mitochondrial membrane potential, the release of cytochrome c from the mitochondria, and translocation of Bax protein to the mitochondria from the cytosol. Administration of GTE reduced renal oxidative stress, protein levels of mature caspase-1, IL-1 , and IL-18. GT catechins affect lipid metabolism by different pathways and prevent the appearance of atherosclerotic plaque. GT extract intake decreases the absorption of triglycerides and cholesterol and these findings are in accordance with the fact that fat excretion increases. Many epidemiological, case-control, and cohort studies have been conducted to investigate the effects of tea consumption on human cancer incidence, and this topic has been reviewed by several authors. The anti-carcinogenic effects of GT have been seen in many types of cancer, and the mechanisms may include inhibiting angiogenesis and cell growth, and inducing apoptosis in cancer cells. Green tea have also pleiotropic effect on Alzheimer, Antiparkinsonian activity , Antidiabetic activity, as a Nephroprotective agent, Hepatoprotective, Cardioprotective activity.

Key words: Green Tea, Pleiotropic, Alzheimer, Nephroprotective, hepatoprotective

PHARMACEUTICAL SIGNIFICANCE OF EARTHWORMS

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Abstract

The medicinal and nutritional values of Earthworms have long been documented in Ayurveda, as well as many countries like China, Japan,Vietnam and Korea. With the development of biochemical technologies, research on pharmaceutical activities of earthworm extract was initiated. Earthworms' extract contains abundant bioactive substances of pharmaceutical and physiological importance like anti coagulating fibrinolytic enzymes vizlumbrokinase, plasmin, collagenase, profibrinolysin activator, clostridiopetidas eA, polyphenols, G-90 glycoproteins consisting of serine proteases, insulin like growth factor, epidermal growth factor and immunoglobulin like growth factor, cellulase and antioxidant superoxide dismutase.Biomolecules extracted from earthworms also have mitogenic, antibacterial, anti-thrombosis, anti-apoptosis haemostatic, tissue regeneration and wound healing properties.Lumbrokinase (LK), as a potent clot dissolver; bronchial dilating substance,extracted from different species of earthworm of earthworms, especially from Lumbricusrubellusis available with different trade names like Plasmin Plus capsulesthat help to protect against myocardial ischemia and heart attack and is now used as a dietary supplement and for reducing inflammation resulted from diseases. Extract of Eiseniafetidacoelomic fluid contain significant

amounts of phenols which have antioxidant effect for curing ailments related to inflammation and oxidative stress and extract of Lampitomauritii shows significant amounts of anti-inflammatory activities.Indigenous earthworm Perionyx excavateshas shown a significant hepatoprotective and antioxidant effect against alcohol induced rats. Earthworms now are being used to treat variety of diseases like Bladder stones, jaundice and alopecia. In depth research has to be carried out in developing countries also, to strengthen the concept of pharmaceutical importance found in earthworms.

Keywords: Pharmaceutical, Lumbrokinase(LK), Lumbricusrubellus, Eiseniafetida, Lampitomauritii

HYPERTENSION IN DEVELOPING COUNTRIES : A MAJOR CHALLENGE FOR THE FUTURE

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Abstract

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

Key word: Hypertension, risk factor, blood pressure, stroke.

PHARMACOLOGICAL ACTIONS OF ALOE VERA

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Abstract

Aloes is the dried juice of the leaves of Aloe barbadensis Miller, known as Curacao aloes; or of Aloe perryi Baker, known as Socotrine aloes; or of Aloe ferox Miller and hybrids of this species with Aloe Africana Miller and Aloe spicata Baker, known as Cape aloes. Aloe Vera is the oldest medicinal plant ever known and the most applied medicinal plant worldwide. The word aloes has originated from the Arabic word viz. alloch meaning a shining bitter substance. Extracts of Aloe vera is a proven skin healer. Antitumor activity of 50% ethanol extract (100 mg/kg) of Aloe Vera was evaluated against Ehrlich ascites carcinoma (EAC) tumor in mice. The effect of Aloe Vera on the growth of transplantable ascites tumor, body weight of EAC bearing hosts and simultaneous alterations in the hematological profile, serum and liver biochemical parameters (lipid peroxidation, GSH and antioxidant enzymes) were estimated. The Aloe Vera showed decrease in abdominal circumference

and body weight of EAC tumor bearing mice. Aloe Vera showed statistically significant anti-ulcer activity comparable to standard drug omeprazole. The mean ulcer indexes of two drugs are formed to be statistically significant. Therefore, the results were suggestive of anti ulcerogenic activity of Aloe Vera. The antiviral activity against HSV-2 not only before attachment and entry of virus to the Vero cells but also on post attachment stages of virus replication. The effect of diabetes mellitus on lipid metabolism is well established. The present study was designed to examine the potential anti hyperlipidemic efficacy of the ethanol extract from. Oral administration of Aloe Vera gel extract at a dose of 300 mg/kg bodyweight per day to STZ-induced diabetic rats for a period of 21 days resulted in a significant reduction in fasting blood glucose, hepatic transaminases, plasma and tissue (liver and kidney) cholesterol, triglycerides, free fatty acids and phospholipids and a significant improvement in plasma insulin. Aloe Vera plant leaves and gel were macerated in different organic solvents including ethanol, methanol and distilled water. Then, by using agar diffusion assay antibacterial activity was estimated. The Aloe Vera extract of Methanol showed the maximum antibacterial activity as compared to other solvent extracts

Keywords: Antimicrobial, EAC, Antiviral.

SYNTHESIS AND ANTIMICROBIAL ACTIVITY OF COUMARIN CLUBBED GUANINE DERIVATIVES

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Abstract

Multiple bioactive pharmacophores in drugs have been recognized as superior chemical entities capable of simultaneously modulating multiple drug targets, thus overcoming the severe side effects caused by single drug molecules. Coumarin templates have been extensively studied in pursuit of structurally diverse drug development leads due to different molecular targets. Five coumarin clubbed guanine derivatives (7-Hydroxy-4-methyl-3-(2- amino-6-hydroxyguano)-2H-chromen-2-one)8(i-v) were synthesized, characterized, and biochemically tested for in vitro antimicrobial activity against two types of bacteria- Gram positive bacteria Staphylococcus aureus (MTCC 87) and Gram negative bacteria Escherichia coli (MTCC 40) for the primary screening by agar plate diffusion method using nutrient agar medium for standard and for test sample. Ciprofloxacin was used as a standard drug for antibacterial activity and DMSO was used as control. The zone of inhibition was observed in mm. It was observed that all of the compounds 8(i), 8(ii), 8(iii), 8(iv), and 8(v)had noticeable activity. The Compounds 8(i), 8(ii), 8(iii), 8(iv), 8(v) were found to had marked activity with zone of inhibition of 8(i) was 4mm (100µg/ml), 14mm (250µg/ml), 17mm (500µg/ml); Compound 8(ii) was 6mm (100µg/ml), 18mm (250µg/ml), 22mm (500µg/ml); Compound 8(iii) 10mm (100µg/ml), 17mm (250µg/ml), 20mm (500µg/ml), Compound 8(iv) was 7mm (100µg/ml), 16mm (250µg/ml), 17mm (500µg/ml), and the compound 8(v) was 6mm (100µg/ml), 15mm (250µg/ml), 20mm (500µg/ml) respectively against Escherichia coli (negative strain). All synthesized compounds exhibited mild to moderate antibacterial activity towards Staphylococcus aureus and Escherichia coli at all concentrations (100 g/ml, 250 g/ml, and 500 g/ml).

Keywords: Coumarin, Guanine, Staphylococcus aureus, Escherichia coli and Antimicrobial activity.

PHARMACOGNOSTIC CHARACTERIZATION OF *THALICTRUM FOLIOLOSUM* DC.-AN UNEXPLORED TRADITIONAL HERB

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Abstract

Ethnomedicinally, the roots of *Thalictrum foliolosum* DC has long been used traditionally in ophthalmia as a collyrium, improves eye-vision, relieves toothache, in diarrhoea, cure piles to good extent, nail troubles, and also in discoloration of the skin. Because of lack of proper identification of plants, standardization of crude drugs becomes difficult. So, to ensure efficacy, safety and purity of *T. foliolosum*, there is a requirement to create quality control parameters by using pharmacognostical and phytochemical screening. In this study the evaluation of pharmacognostical parametrs including organoleptic, microscopical and physico-chemical and phytochemical screening of *T. foliolosum* roots performed. Organoleptic and microscopical characters of dried sample of root were observed. Physico-chemical parameters performed by applying WHO guidelines, fluorescence analysis and phytochemical screening of root sample were also completed for standardization and identification of root of *T. foliolosum*. Macroscopical characters like color, odor, shape, texture, size, fracture was observed from root and powdered root material of *T. foilolosum*. Microscopical characters of root showed the presence of parenchymatous cells, cork cells along with pitted and sclariform vessels. Phytochemical evaluation specified the presence of various secondary plant metabolites like alkaloids, steroids, saponins, proteins, tannins, flavonoids and triterpenoids. Physico-chemical parameters such as extractive value, Moisture content, ash value, florescence behaviour of root powder was performed. These all evaluated parameters help to distinguish the powdered drug material. This current study will help in standardization and identification along with carrying out further research in herbal medicinal system.

Keywords: *Thalictrum foliolosum*, Microscopy, Phytochemical alalysis, Standardization.

COUNTERFEIT MEDICINES

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Abstract

Substandard or spurious drugs are the main concern at global level, which result in life threatening issues, financial loss of consumer and manufacturer and loss in trust on health system. There are some schemes by Indian Government for distribution of free generic medicines for certain categories of patients. However, people accept, prefer and buy counterfeit or substandard products over genuine or branded products due their cheap price, easy accessibility and availability in the market. Consumer does not know about the manufacturer or the quality of the product and many times they are unaware of expired, degraded or substandard products which ultimately results in failure of the treatment and with antibiotics this lead to antimicrobial resistance. Substandard product arises correspondingly due to lack of expertise, unfair manufacturing practices or insubstantial infrastructure; whereas counterfeit is the product of black marketer. For minimizing spurious/falsely-labelled/falsified/counterfeit drugs or not of

standard quality drugs, there is urgent requirement of more stringent regulation and legal action against the problem. However, India has taken some preventive steps in the country to fight against the poor quality drugs for protecting and promoting the public health.

Keywords: Poor quality drugs, Central Drugs Standard Control Organization.

COMPENDIUM OF *PASPALUM SCROBICULATUM* (KODOMILLET): A RESEARCH

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Abstract

Paspalum scrobiculatum Linn. belongs to family 'Poaceae'. 'Kodo millet' is its common name. It is a feathered everlasting grass of 120-150 cm height. It is an extremely drought resistant crop. This plant flourish even in very poor soils. Kodo millet is a minor grain crop grown throughout India, but to a greater extent in the Deccan and South India. Distributed in Madhya Pradesh, Chhattisgarh and Karnataka. *Paspalum scrobiculatum* (Kodomillet) plant found in various regions of India is found to possess number of pharmacological activities such as nutritive, anti fungal, antidiabetic etc. The researchers are more focused these days on exploring other potential activities of this plant and the constituents present. Present study emphasized on preliminary analysis such as macroscopic study, phytochemical analysis, Physicochemical investigation, determination of ash content, TPC, TFC, antioxidant property and characterization of extracted components with different spectral techniques and antiulcer potential. Further this study will be helpful in determination of its medicinal importance in Pharmacy.

Keywords: *Paspalum scrobiculatum*, Spectral analysis, Antioxidant Activity, Physicochemical properties, Phytochemical profile, Antiulcer potential.

NANOSTRUCTURED LIPID CARRIER BASED NSAIDS FORMULATIONS FOR MANAGEMENT OF PAIN AND INFLAMMATORY CONDITIONS: COMPREHENSIVE REVIEW

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Abstract

Nanostructured lipid carriers, also known as NLCs, are innovative pharmaceutical formulations that are made up of lipids that are physiologically and biocompatible with other lipids, as well as surfactants and co-surfactants. NLC has developed as a reasonable alternative to nanoparticles of the first generation over the course of time as a lipid nanocarrier of the second generation. NLCs are a new generation or second generation of Solid lipid nanoparticles which were designed to solve issues concern with Solid lipid nanoparticles. For the formulation of NLC, a small portion of solid lipid is substituted by liquid lipid. It results in a highly disordered lipid structure, which provides more space for drug loading and prevents drug leaching during storage. Nanostructured lipid carrier is the evolution for SLN, with some improvements in the encapsulation efficiency.

The encapsulation efficiency of NLC is better than the encapsulation efficiency of SLN because solid-liquid mixing proportion is better than single solid lipid. This review paper focuses on the composition, various formulation strategies and characterisation of NLCs, all of which are necessary for the process of formulating a stable drug delivery system. This review also summarizes the main innovative nanocarriers utilised for carrying various nonsteroidal anti-inflammatory drugs (NSAIDs) for the treatment of pain and inflammatory conditions.

DECRYPTING THE RECENT ADVANCEMENTS IN NANOTECHNOLOGICAL STRATEGIES AND THERAPEUTIC APPLICATIONS OF BETULINIC ACID

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Abstract

Herbal drugs have always attracted a lot of scientific interest, and research is still ongoing to determine their medicinal potential. The one family of natural products is called Terpenoids which are derived from the secondary metabolites and merely found in the flowers, fruits, and vegetables. A pentacyclic lupane-type triterpenoid, betulinic acid (BA, 3-beta-hydroxy-lup20 (29)-en-28-oic acid) belong to the Betulaceae family is found in a wide variety of plants. There are high concentrations of betulinic acid (up to 2.5%) in the outer bark of several tree species that are valued for their timber. White-barked birch trees (Betula species) generate up to 22% of the chemical called betulinic acid. BA has generated a lot of interest due to the vast range of biological and pharmacological functions that have been linked to this molecule, including its anti-inflammatory, antibacterial, antidiabetic, antimalarial, anti-HIV, and anti-tumor effects. Despite having a huge therapeutic potential, terpenoids have undesirable pharmacokinetic characteristics that severely limit their use in therapeutics due to their poor solubility and low BA. In the meantime, the objective of the current study is to present new updates on major therapeutic uses of betulinic acid and different types of nanocarriers that carry betulinic to treat a variety of diseases. Nanotechnology has been suggested as a potential treatment for these problems.

UNFOLDING THE THERAPEUTIC POTENTIAL AND NANOTECHNOLOGY-BASED ASPECTS OF FERULIC ACID: CURRENT AND FUTURE DEVELOPMENT

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Abstract

Ferulic acid (FA), a common natural phenolic phytochemical, is found in seeds, leaves, and is covalently coupled to lignin, hydroxy fatty acids, glycoproteins, and polyamines in plant cell walls. According to a number of studies over the past few years, FA functions as a potent antioxidant by scavenging free radicals and enhancing the cell stress response through the up-regulation of cytoprotective systems like heme oxygenase-1, heat shock protein 70, extracellular signal-regulated kinase 1/2, and the proto-oncogene Akt. FA has a wide range of biological properties including metal chelation, modulation of enzyme activity, activation of transcriptional factors, gene expression, and signal transduction. It also has anti-inflammatory, anti-microbial, anti-allergic, hepatoprotective, anticarcinogenic, and antithrombotic properties. The primary skin tissues, including keratinocytes, fibroblasts, collagen, and elastin, are protected by ferulic acid. This study's objective is to present the most recent data on major therapeutic applications of FA and other nanocarrier formulations for administering FA to patients with various disorders.

OMEGA-3 FATTY ACID AS NUTRACEUTICAL: A THERAPEUTIC APPROACH TO RHEUMATOID ARTHRITIS

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Abstract

Recently nutritional science has equipped importance in the field of research towards the medical advantage of patients experiencing several immune system diseases viz. alzheimer's disease, cardiovascular disorders, parkinson disease, diabetes mellitus, cancer and rheumatoid arthritis. Nutraceuticals are characterized as any substance other than food which can be utilized in suppressing, ensuring, and treating ongoing chronic diseases. It is regarded as a drug supplement which is directed by FDA under the power of the Drug and Cosmetic act. Multiple research findings suggest that Omega-3 supplements possess antioxidant potential and is well capable of reducing the risk of developing rheumatoid arthritis (RA). Rheumatoid joint pain is a chronic, autoimmune and inflammatory disorder, which influences multiple small joints of hands and feet, with varying severity among patients. The primary causes leading to RA are still undefined, but dysregulation of certain genes, hormones and environmental factors may contribute to RA progression. Omega-3 polyunsaturated fatty acids (PUFAs) are said to serve immunomodulatory properties as they give rise to lipid mediators of inflammation which might restrict or modulate the inflammatory responses. Omega-3 fatty acids appear to constrict experimental joint inflammation and have a beneficial effect in the treatment of rheumatoid arthritis. N-3 PUFAs reduce oxidative stress, inflammatory, and vasogenic processes. Omega-3 fatty acids have been displayed to diminish morning stiffness, number of tender joints and swollen joints in patients with rheumatoid joint inflammation.

PHARMACOVIGILANCE: AN EMERGING DOMAIN

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Abstract

Pharmacovigilance can be defined as a survey, or assessment done for the medicinal drug or device from the time of Preclinical studies till it comes into the market and later. It is done to report any adverse effects associated with the medicinal drug among the population. It is also related to the prevention of any adverse effects in the long run. Pharmacovigilance is a very broad word and carries an ample amount of weightage in the field of clinical research, right from the discovery of the drug till the time it comes out in the market and is used by the population. It is an ever-ending process because till the time the drug is on the market it is in continuous evaluation. It is rigorous testing done for the safety and toxicity profiling of the medicinal drug. Pharmaceutical businesses receive four key services from pharmacovigilance: risk management, aggregate reporting, signal intelligence, and adverse event case management, which include expedited reporting. Passive surveillance is one of four crucial pharmacovigilance techniques. The rest are active observation, cohort event surveillance, and targeted clinical research. Some software used in pharmacovigilance are: as Oracle Argus Safety, ArisG, Oracle Adverse Event Reporting System (AERS), ClinTrace, PvNET, repClinical.

ROLE OF GREEN CHEMISTRY IN MEDICINAL CHEMISTRY

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Abstract

Green chemistry also known as sustainable chemistry is used to design chemical products and procedures that reduce generation of hazardous chemical substances. It provides a new approach to the synthesis, processing and application of chemical substances in such a manner so as to reduce threats to health and environment. This presentation aims to depict the role of Green Chemistry in medicinal chemistry. It also includes the case study of various drugs that have been designed according to the methodologies of Green Chemistry that has helped to reduce both cost and energy consumed while synthesizing various organic compounds that play an important role in the field of medicinal chemistry which deals with the study of synthesis and formation of various chemical compounds. Towards the end of the presentation, we have also included an experiment that explains the synthesis of a Nonsteroidal Anti- inflammatory drug Aspirin using the conventional form of synthesis which is compared to the synthesis using Green Chemistry.

INSIGHTS INTO DRUG DISCOVERY AND DEVELOPMENT

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Abstract

Most often, the urge for developing a new medicine begins when basic scientists learn of a biological target like- a protein, receptor, gene etc. which is involved in hindering the biological processes in people with various diseases. Better medicines that are iterative improvements on the existing medications are valuable as they may offer benefits over the existing medications in terms of toxicity, potency etc. But they usually do not involve the manipulation of the biological targets that are different from the current drugs. Various analyses across all therapeutic areas indicate that the entire process takes almost 12 years. This process of drug discovery and development represents the journey of a molecule from the stages of being a drug until it reaches the clinical patient. It involves the key processes:target identification, target validation, lead identification, lead optimization, preclinical development, and clinical studies. The main objective of a preclinical drug discovery process is to deliver one or more candidate molecules that have a potential availability of biological activity relevant to a disease as well as sufficient safety and drug likeliness. Most of the discovery programs have a plethora of candidate molecules because not all of them move through the entre process because of problems with kinetics, safety, potency etc. The biological target, even one with validating data, will only be useful for drug development if it is therapeutically useful. The molecules must have pharmacokinetic (PK) properties that enable them to have an effective relationship between the dose, exposure and binding of the drug to the target of therapeutic interest. Fortunately, advances in medicinal chemistry and biological PK modelling have reduced the number of molecules entering clinical development with unsatisfactory PK properties. Thus, drug developers seeking medicines for diseases, such as AD, cancer, or other difficult to treat diseases, are very eager to learn about new targets that might be the focus of a new drug discovery program.

ARTIFICIAL INTELLIGENCE IN DRUG DISCOVERY AND DEVELOPMENT

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Abstract

The pharmaceutical industry is currently one of the sectors of society where artificial intelligence (AI) is starting to ramp up its application. This presentation emphasizes the practical applications of AI in the pharmaceutical industries, including drug discovery and development, medication repurposing, increasing pharmaceutical output, clinical trials, etc., to mention a few, which can help cut down on human workload and speed up target achievement. The future of AI in the pharmaceutical sector is also examined, along with the tools and methods used to enforce AI, ongoing difficulties, and solutions to them. Artificial intelligence (AI) has become more prevalent in several societal fields, most notably the pharmaceutical industry. In this presentation, we focus on how AI is used in various pharmaceutical industry fields, such as drug discovery and development, drug repurposing, increasing pharmaceutical productivity, and clinical trials. This use of AI lessens the workload of human workers while also achieving goals quickly. We also talk about how various AI tools and methodologies interact, current problems and solutions, and the potential applications of AI in the pharmaceutical sector.

HEART FAILURE

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Abstract

Heart failure (HF) is a progressive clinical syndrome caused by inability of the heart to pump sufficient blood to meet the body's metabolic needs. HF can result from any disorder that affects the ability of the heart to contract (systolic dysfunction) and/or relax (diastolic dysfunction). HF with reduced systolic function (ie, reduced left ventricular ejection fraction, LVEF) is referred to as HF with reduced ejection fraction (HFrEF). Preserved LV systolic function (ie, normal LVEF) with presumed diastolic dysfunction is termed HF with preserved ejection fraction (HFpEF). The leading causes ofHF are coronary artery disease and hypertension. Clinical Manifestations for both A-Left-sided failure. B-Right -sided failure.

Staging and New York Heart Association (NYHA) classification of heart failure.

Treatment of Chronic Heart Failure

Goals of Treatment: Improve quality of life, relieve or reduce symptoms, prevent or minimize hospitalizations,slow disease progression, and prolong survival. The American College of Cardiology/American Heart Association (ACC/AHA) staging system provides a morecomprehensive framework for evaluating, preventing, and treating HF Management of HFpEF: Treatment includes controlling heart rate (HR) and blood pressure (BP), alleviatingcauses of myocardial ischemia, reducing volume, and restoring and maintaining sinus rhythm in patients withatrial fibrillation. Many of the drugs are the same as those used to treat HFrEF (eg, ß-blockers and diuretics), but the rationale and dosing may be different. Calcium channel blockers (eg, diltiazem, amlodipine, and verapamil) may be useful in HFpEF but have little utility in treating HFrEF. Nonpharmacologic interventions include cardiac rehabilitation and restriction of fluid intake (maximum 2 L/dayfrom all sources) and dietary sodium (<2–3 g of sodium/day). Drugs that aggravate HF should be discontinued if possible.

NANOPARTICLE AS NOVEL CARRIER FOR BRAIN DELIVERY

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Abstract

A significant barrier to the transfer of bioactive into the brain is the blood-brain barrier (BBB). It acts as a substantial barrier to the entrance of hydrophilic medications, and the efflux pumps on its surface prevent the buildup of pharmacological moieties inside brain cells. In this context, nanoparticles (NPs) have the potential to be a module for transporting significant quantities of medication over the BBB. To get access to the brain and reduce the toxicity of treatment, they can be made with a targeting moiety or coated on surfaces. To increase the likelihood of disease-free life, the NPs can act as an exclusive dais for the spatial and temporal distribution of pharmacological substances across the brain. This presentation investigates several potential pathways by which NPs may enter the brain, including adsorption, receptor-mediated endocytosis, transcytosis, inhibition of the p-glycoprotein efflux pump, membrane permeabilization effect, and BBB disruption. To provide more precise medication administration, the study also discusses the potential for NPs to improve the movement of therapeutic molecules across the brain.

INCREDIBLE RESEARCH WITH MURASHIGE AND SKOOG MEDIUM (MS) IN PLANT TISSUE CULTURE ON SELAGINELLA BRYOPTERIS (SANJEEVANI BOOTI)

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Abstract

Medicinal plants have been used as a medicinal source to treat various human health disorders around the world from ancient times to the present day. They are an important natural wealth. They provide basic medical care to people from all walks of life. They serve as important therapeutic agents as well as important raw materials for the production of traditional and modern medicines. Plants are one of the most important sources of medicine. Essential components of medicinal plants used as medicines or for basic needs are seeds, flowers, roots, leaves, fruits, peel, and even the whole plant. Medicinal plants contain a variety of metabolites with tremendous properties that are excellent for treating many diseases and these bioactive substances include carbohydrates, tannins, flavonoids, alkaloids, terpenoids, and steroids. Due to the development of modern techniques, several specific protocols have been developed for the commercial-scale production of a wide range of secondary plant metabolites. Plant tissue culture has made significant contributions recently and now represents an indispensable tool for the advancement of agricultural science and modern agriculture. All treatments can induce shoot and leaf, But the most effective treatment we observed was the concentration of 1.5 mg/L BAP. In Vitro raised Selaginella bryopteris planted in a Pot, growing for around 2-3 months in polyhouse condition for future study. This research would allow us to analyze the development of plant tissue culture for agriculture, human health and well-being are generally obtainable.

Keywords: Important, Medicinal plants, Flavonoids, Alkaloids, Indispensable.

ADVANCES IN TUMOR TARGETING DELIVERY SYSTEM WITH THE USE OF LIPOSOMES

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Abstract

Despite effective treatment, cancer continues to be a fatal disease. Intriguingly capable of carrying both hydrophilic and hydrophobic medicines, liposomes are potentially biodegradable and biocompatible nanocarriers with the potential for surface and internal alterations. The creation of multifunctional liposomes, which target cells and tissues with the help of a single delivery mechanism, has recently received a lot of attention. Contrary to conventional medication delivery methods, drugs based on nanoparticles achieve excellent absorption in the tumor site through either active or passive mechanisms. With fewer harmful off-target effects, passive and ligand-mediated functional targeting increase tumor selectivity. The improvements in tumor-targeted liposomes using different targeting methods are outlined in this presentation. Chemists and ambitious researchers will get a new understanding from this presentation which will help them create cancer-targeted liposomes.

Keywords: Tumor targeting, Liposomes, Tumor, Advances, Deadly disease, Nano carriers.

MOLECULAR & CELLULAR MECHANISMS INVOLVED IN TREATMENT OF BIPOLAR DISORDER

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Abstract

Bipolar disorder (BD) is a chronic and progressive psychiatric illness characterized by exacerbations of opposite mood polarity like episodes of mania, depression and mixed states . This is noted that patients suffering from this disorder experience unusual mood changes with a wide variety of typical behavioral facets, affecting overall activity, energy, sexual behavior, sense of self, self-esteem, circadian rhythm, cognition, increased risk for suicide and patients with bipolar disorder are exceptionally challenging to manage because of the dynamic, chronic, and fluctuating nature of disease . Treatment of this disorder is primarily done with mood stabilizers, but many patients either show resistance to the conventional mood stabilizing medications or are intolerant to their side-effects. Effective treatment options are still limited . A major challenge in BD is the development of effective drugs with low toxicity for the patients.To overcome these obstacles,a better understanding of the neurobiology ,pathophysiology ,cellular and molecular pathways underlying bipolar disorder is needed;which may lead to the development of new drug. We should also investigate optimum combinations of pharmacological and psychotherapeutic treatments at different stages of the illness. Better knowledge of cellular and molecular mechanisms by which different treatments affect sleep and circadian rhythms and their relation with daily mood fluctuations is likely to help with the treatment selection for individual patients.

Keywords: Bipolar disorder, mania, circadian rhythms

MEDICATION ERROR

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Abstract

Medication error is an error that is done by the person which is given to a patient and that has been fully observed by someone. Several types of medications errors are described and they are: Prescribing error, Omission error, Wrong time error, Unauthorized drug error, Improper dose errors, Wrong dosage form error, Wrong drug preparation errors, Wrong administration technique errors, Deteriorated drug errors, Monitoring Errors, Compliance error. Medicines are used to reduce chronic disease and pain but there can be mistakes in this process whether it by doctor, hospital or pharmacist. Keep a list of medicines that how many doses the medicine is made of, which herb is made up and how long it is to be taken. Small things happen that lead to serious problems that one kill someone. That's why this work should be done carefully so that no one can be blamed and helpful for the society or environment.

Keywords: Medication error, Medicines, Prescription, Adverse effects.

ROLE OF PINEAPPLE AND BIOACTIVE COMPOUND BROMELAIN IN BREAST CANCER

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Abstract

Breast cancer is the leading cause of death in Indian and worldwide women due to its high morbidity and mortality rates. Treatments for breast cancer have often been linked to side effects, and many of the most effective drugs are also highly toxic. Breast cancer-related pathways are modulated by natural compounds that inhibit cell proliferation. From the literature it was found that pineapple and its bioactive compound bromelain showed therapeutic potential in breast cancer. Various mechanisms were responsible for their anticancer effect i.e., Bcl-2 and Cox-2 transcriptional expression was downregulated. Inhibition of breast cancer cell growth was achieved by enhancing p53 and Bax expression and by decreasing Cox-2 and Bcl-2 expression by bromelains. The current presentation showed the anticancer effects of pineapple and its bioactive compound bromelain in breast cancer with mechanisms of action responsible for their anticancer effects.

Keywords: Pineapple, Bromelain, Anticancer, Breast cancer, Treatment.

ROLE OF GREEN CHEMISTRY IN MEDICINAL CHEMISTRY

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Abstract

Green Chemistry also known as sustainable chemistry is used to design chemical products and procedures that reduce generation of hazardous chemical substances. It provides a new approach for the synthesis, processing and application of chemical substances in such a manner so as to reduce threats to health and environment. This presentation aims to depict the role of Green Chemistry in medicinal chemistry. It also includes the case study of various drugs that have been

designed according to the methodologies of Green Chemistry that has helped to reduce both cost and energy consumed while synthesizing various organic compounds that play an important role in the field of medicinal chemistry which deals with the study of synthesis and formation of various chemical compounds. We have also included an experiment that explains the synthesis of a Nonsteroidal Anti- inflammatory drug Aspirin using the conventional form of synthesis which is compared to the synthesis using Green Chemistry.

Keywords: Green chemistry, Synthesis, Environment.

EVALUATION OF ANTIBACTERIAL AND ANTIFUNGAL PROPERTY OF SYZYGIUM CUMINI LEAF EXTRACT ON DERMAL PATHOGENS

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Abstract

Syzygium cumini Linn., often known as Jamun, is a large, very common evergreen tree native to the Indian Subcontinent that grows to a height of about 25 meters. It is a member of the Myrtaceae family, which has 150 genera and 3600 species spread around the world. Eugenia djouant Perr., Eugenia cumini, Eugenia jambolana Lam, Syzygium jambolana Lam. And Myrtus cumini Linn. are synonyms of Syzygium cumini. The pharmacological properties of Syzygium cumini include anti-diabetic, anti-inflammatory, antimicrobial, antibacterial, antifungal, antioxidant, antigenotoxic, anti-leishmanial, brine shrimp lethality, antihyperlipidemic, central nervous system, antiallergic, antifertility, gastroprotective, and radioprotective properties. In the present study, the leaves of Syzygium cumini Linn family Myrtaceae were chosen for phytochemical evaluation and potential antimicrobial activity. Using the sequential cold percolation procedure, the leaf powder was exposed to successive extraction with different solvents, including petroleum ether, chloroform, ethanol, and water. Following successful extraction, solvents were distilled off through vacuum evaporation. The concentrated extracts were used to conduct phytochemical screening and antimicrobial research. The phytochemical research revealed the key active chemical components to be sterols, triterpenoids, tannins, flavonoids and phenolic compounds. The disc diffusion method was used to evaluate all plant extracts for antimicrobial activity against various isolates of bacteria and fungi. DMSO was used to dissolve the dried leaf extracts from various solvents for the antimicrobial assay. Two fungal strains (Candida albicans, non-albicans candida), and four bacterial strains including two gram-negative bacteria, Pseudomonas aeruginosa and Acinetobacter baumannii, and two gram-positive bacteria, Streptococcus pyogenes and Staphylococcus aureus were used in the research work. By observing the results of antimicrobial study of different solvent extracts of S. cumini, it can be concluded that the ethanolic extract and aqueous extract had shown more strong antibacterial activity while petroleum ether extract and chloroform extract failed to produce significant antibacterial activity. All the above extracts failed to produce any antifungal activity.

Keywords: Sequential cold percolation, Antioxidant, Antimicrobial, Disc diffusion method, Phytochemical screening.

EXPOSURE TO ALZHEIMER'S DISEASE IN CUTTING-EDGE ERA

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Abstract

Alzheimer's disease is the common form of dementia that usually occurs in old age. It is most progressive disease that frequently effects the cognition power, personality and behavior. In 1906, when German physician got a woman patient whose name was Auguste D suffering from mental illness. When she died after 5 years, during her autopsy narrowing and shrinkage of brain was observed. Etiology includes down syndrome in which there is trisomy of chromosome 21. Other factors include family history, increasing age, poor habits and obesity. Basically, Alzheimer's disease occurs due to the accumulation of senile plaques and neurofibrillary tangles formed in the neurons. Genetics also play a pivotal role in Alzheimer's like Presenilin 1, Presenilin 2 and APO E genes are responsible in Alzheimer's disease. In addition, neurotransmitters which are chemical substances used to communicate neurons in cell signaling decreases. The level of acetylcholine declined gradually. Some pharmacological therapies have been approved by FDA, that is NMDA antagonists and cholinesterase inhibitors.

Keywords: Alzheimer's disease, Dementia, Cognition power, Presenilin

ARTIFICIAL INTELLIGENCE IN DRUG DISCOVERY AND DEVELOPMENT

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Abstract

The pharmaceutical industry is currently one of the sectors of society where artificial intelligence (AI) is starting to ramp up its application. This presentation emphasizes the practical applications of AI in the pharmaceutical industries, including drug discovery and development, medication repurposing, increasing pharmaceutical output, clinical trials, etc., to mention a few, which can help cut down on human workload and speed up target achievement. The future of AI in the pharmaceutical sector is also examined, along with the tools and methods used to enforce AI, ongoing difficulties, and solutions to them. Artificial intelligence (AI) has become more prevalent in several societal fields, most notably the pharmaceutical industry. In this presentation, we focus on how AI is used in various pharmaceutical industry fields, such as drug discovery and development, drug repurposing, increasing pharmaceutical productivity, and clinical trials. This use of AI lessens the workload of human workers while also achieving goals quickly. We also talk about how various AI tools and methodologies interact, current problems and solutions, and the potential applications of AI in the pharmaceutical sector.

Keywords: Artificial intelligence, Drug discovery and development, AI in pharmaceutical industry.

ADVANCES IN TUMOR TARGETING DELIVERY SYSTEM WITH THE USE OF LIPOSOMES

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Abstract

Despite effective treatment, cancer continues to be a fatal disease. Intriguingly capable of carrying both hydrophilic and hydrophobic medicines, liposomes are potentially biodegradable and biocompatible nanocarriers with the potential for surface and internal alterations. The creation of multifunctional liposomes, which target cells and tissues with the help of a single delivery mechanism, has recently received a lot of attention. Contrary to conventional medication delivery methods, drugs based on nanoparticles achieve excellent absorption in the tumor site through either active or passive mechanisms. With fewer harmful off-target effects, passive and ligand-mediated functional targeting increase tumor selectivity. The improvements in tumor-targeted liposomes using different targeting methods are outlined in this presentation. Chemists and ambitious researchers will get a new understanding from this presentation which will help them create cancer- targeted liposomes.

Keywords: Tumor targeting, Liposomes, Tumor, Advances, Deadly disease, Nano carriers.

ARTIFICAL INTELLIGENCE USED IN PHARMACY

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Abstract

Over many centuries, tools of increasing sophistication have been developed to serve the human race Digital computers are, in many respects, just another tool. They can perform the same sort of numerical and symbolic manipulations that an ordinary person can, but faster and more reliably. Artificial intelligence algorithms applying in computer application and software. Include knowledge-based systems; computational intelligence, which leads to Artificial intelligence, is the science of mimicking human mental faculties in a computer. That assists Physician to make dissection in medical diagnosis. Long days ago, there was all kind of work which is only done by the humans. There were no such machines and technologies like today. At that time, science is not developed and technologies were not invented, so the working is totally dependent on the peoples and humans have recognized that "Today's science is the tomorrow's technology". New superiorly advanced technologies are not less than blessing of god. Adaptive inventions for reducing the human work and bright future were invented which is simply called as Artificial Intelligence and Machine learning. Even though there were many false assumptions at the early beginning, we are witnessing a new era of errorless technology and superior science.

Keywords: Computational intelligence, Digitalization, Knowledge based system, Symbolic agents.

TREATMENT OF LEISHMANIASIS WITH DATURA STRAMONIUM LEAF EXTRACT

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Abstract

Introduction: The leishmaniases are three main forms of the disease: cutaneous leishmaniasis, mucocutaneous leishmaniasis and visceral leishmaniasis which is also known as kala-azar.

Aims & Objective: Detection of antiprotozoal activity against Leishmania donovani through Datura stramonium Jimsonweed (Solanaceace), leaf extract.

Materials & methods: The materials were washed under running tap water, blotted with filter paper, were dried in the shade at room temp. 50gm of each of the freshly prepared plant material was extracted with 500 ml of ethanol by Soxhlet apparatus for 48 h. The ethanolic extracts of plants were analysed for the presence of alkaloid, saponin, flavonoid, fixed oils and fats, tannins and phenolic compounds according to standard methods. 2gm of the ethanolic plant extract of Datura stramonium was taken to separate the extract into its component fractions by column chromatography. Promastigotes were cultivated axenically in vitro at ± 30° C in monophasic liquid medium, M-199, supplemented with 10% (v/v) heat inactivated foetal bovine serum (FBS) and 25mM N-(2-hydroxyethyl) piperazine-N'-2-ethane sulfonic acid (HEPES).

Results: Datura stramonium (datura) belonging to family Solanaceae on promastigote form of leishmania to provide effective treatment against L. donavani. Phytochemical screening of the two selected plant extracts showed the presence of different percentage of active phytochemicals such as alkaloid, flavonoid, fixed oil and fats, saponin, tannin and phenolic compounds etc. In contrast, the phenolic content of the ethanolic extract of Datura stramonium (datura) was found to be 15.34 ± 0.53 mg GAL/g per gram dry weight basis. The flavonoid content of the ethanolic extract of Datura stramonium (datura) in terms of quercetin equivalent was found to be 2.43 ± 0.12 mg/g. The difference in total phenolic and flavonoid content of each of the corresponding extracts was found statistically significant (p 0.05).

Conclusion: The leishmanicidal activity of the extracts of plants Datura stramonium have been found efficacious on promastigote form of leishmania to provide effective treatment against L. donavani. Our results corroborate the ethnopharmacological use of these plants for the treatment of Leishmaniasis.

Keywords: Leishmania, Datura stramonium, Leaf extract.

GREEN CHEMISTRY AND PYRIDINE CONTAINING ANTICANCER MOLECULES FOR PROTEIN KINASE INHIBITION ACTIVITY

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Abstract

Green Chemistry defines new procedures towards the synthesis, processing and application of chemical substances that minimizes the hazards to human health and environment. In the pharmaceutical field, Green Chemistry works very well with the formation of many drugs and ututilizes non-hazards, reproducible and environment-friendly solvents with low time and money costs by using catalyst, microwave, ultrasonic, solid phase and solvent-free synthesis. Until now, scientist has synthesized many anticancer molecules containing Pyridine moeity by using these modern green chemistry techniques. The pyridine core structures have been noted for their roles in many biological processes as well as in cancer pathogenesis, which make such compounds become attractive scaffolds for discovery of novel drugs. Protein kinase inhibitors (PKIs) are antineoplastic substances that are used to block the constant or overactivity of dysregulated protein kinases. The abnormal expression of PKIs could course tumorigenesis, as well as tumor invasion and metastasis, tumor neovascularization and tumor chemotherapy resistance. Therefore, PKIs has become a hot target for anti-tumor drug research. Various synthetic and natural molecules having single and multiple kinase inhibition activity are new strategies for treatment of cancer.

Keywords: Green chemistry, Anticancer activity, Pyridine and protein kinase inhibitors (PKIs).

MEDICAL DEVICES REGULATION IN UNITED STATES OF AMERICA, EUROPEAN UNION AND INDIA

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Abstract

In order to market any medical device, marketing authorization from Regulatory authority is required. The process of gaining authorization is complex, multistep and requires review of information by competent authorities. Upon scrutinizing the information furnished by Manufacturer, marketing authorization is granted by the concerned Regulatory authority. In the USA, manufacturers are required to apply to United States Food and Drugs Application (USFDA) for Marketing Authorization. There are two types of applications in USA; 510 (k) and Pre-Market Application (PMA). In EU, National Authorities give approval for marketing medical devices. A system of third party compliance is followed, where Notified Bodies (Third Party) ensure Quality Assurance, pre and post approval. In India, Central Drugs Standard Control Organization (CDSCO) approves devices for sale and import. Medical Devices are regulated under CLAA scheme. The Drug Controller General of India (DCGI) is the central licensing authority for medical devices. This paper attempts to capture information on regulations of Medical Device in three regions namely; USA, EU and India and compare provisions of Market authorization in the respective regions, and further, for the readers, make this complex subject easier to grasp.

Keywords: Marketing authorization, Regulatory authority, Medical device.

MEDICAL DEVICE REGULATIONS: A CURRENT PERSPECTIVE

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Abstract

There has been an upsurge in the number, diversity, and intricacy of medical devices in last two decades. Regulation of these devices has also advanced due to the requirement for a steady regulatory perspective. Various regulations of medical devices across major economies of the world were reviewed and then other pertinent issues of medical device regulations were discussed. The regulatory guidelines for medical devices in various countries which include United States, Europe, Japan, India, Brazil Japan, Australia etc. were reviewed. The need for harmonization of the device regulations and other regulatory issues were also assessed. Since the early 1980s, the regulatory paradigm for medical devices has changed exceptionally. Currently there are many countries which have enforced medical device regulations. Now with the availability of different regulations of the countries or region on medical devices, there is a need to harmonize regulations in order to curtail regulatory hurdles and expedite access to high quality, safe and efficacious medical devices. Most countries are trying to harmonize the regulatory guidelines for medical devices through their participation in Global Harmonization Task Force (GHTF). Harmonized regulation of medical device will lead to the availability of quality product.

Keywords: Regulatory issues, Harmonized regulation, Regulatory guidelines, Regulatory hurdles, Medical devices.

NIOSOMES AS NOVEL DRUG DELIVERY SYSTEM

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Abstract

Niosomes are non-ionic surfactant vesicles obtained by hydrating mixture of cholesterol and non-ionic surfactants. It can be used as carriers of amphiphilic and lipophilic drug. In niosomes drug delivery system, the medication is encapsulated in a vesicle. Niosomes are biodegradable, biocompatible non-immunogenic and exhibit flexibility in their structural characterization. The main object of this review the application of niosomes technology is used to treat a number of diseases, niosomes have good opportunity in research and beneficial for researcher and pharmaceutical industries. Niosomes appear to be a well preferred drug delivery system over liposome as niosomes being stable and economic. Also niosomes have great drug delivery potential for targeted delivery of anti-cancer, anti-infective agents. Drug delivery potential of niosomes can enhances by using novel drug delivery concepts like pro- niosomes, discomes and aspasome. Niosomes also serve better aid in diagnostic imaging and as a vaccine adjuvant. Thus these areas need further exploration and research so as to bring out or to make for commercially available niosomal preparation.

Keywords: Hydrating mixture, Amphiphilic and Lipophilic drug, Pro-niosomes, Vaccine adjuvant, Encapsulated vesicles

NANOPARTICLE AS NOVEL CARRIER FOR BRAIN DELIVERY

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Abstract

A significant barrier to the transfer of bioactive into the brain is the blood-brain barrier (BBB). It acts as a substantial barrier to the entrance of hydrophilic medications, and the efflux pumps on its surface prevent the buildup of pharmacological moieties inside brain cells. In this context, nanoparticles (NPs) have the potential to be a module for transporting significant quantities of medication over the BBB. To get access to the brain and reduce the toxicity of treatment, they can be made with a targeting moiety or coated on surfaces. To increase the likelihood of disease- free life, the NPs can act as an exclusive dais for the spatial and temporal distribution of pharmacological substances across the brain. This presentation investigates several potential pathways by which NPs may enter the brain, including adsorption, receptor-mediated endocytosis, transcytosis, inhibition of the p-glycoprotein efflux pump, membrane permeabilization effect, and BBB disruption. To provide more precise medication administration, the study also discusses the potential for NPs to improve the movement of therapeutic molecules across the brain.

Keywords: Blood brain barrier, Nanoparticles, Drug delivery, Brain targeting drug delivery, CNS drug delivery.

PHARMACOLOGICAL PROPERTIES OF NOVEL DERIVATIVES OF CHALCONES

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Abstract

Chalcones are phenolic compounds belonging to class of flavonoids they are formed by the reaction of aldehyde and ketone. They are mainly derivatized by aldol condensation and Claisen Schmidt reaction. This research emphasize on pharmacological properties of derivatized chalcones which undergo by two reactions: Treatment of Benzoin(ketone) with cinnamaldehyde(aldehyde) with sodium hydroxide as base in ethanol and camphor(ketone) with cinnamaldehyde(aldehyde). Chalcones are biosynthesized by acetate and shikimate pathways and they were investigated for their biological potentials, pharmacological effects and therapeutic actions like anti-inflammatory, anti-microbial , anti-fungal , anti-cancer , anti-diabetic. Molecular modification in chalcones have shown remarkable anti proliferative activity due to inhibitory potential against target receptor cell lines of tyrosine protein kinase.

Keywords: Chalcones, Phenolic compounds, Tyrosine protein.

DEVELOPMENT, OPTIMATISATION AND FORMULATION OF NANOSTRUCTURED LIPID CARRIERS OF MYCOPHENOLATE MOFETIL USING FORMULATION BY DESIGN

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Abstract

Solid organ transplantation has become standard critical therapy for end-stage organ failure. The major limitation of this therapy is graft rejection and to tackle this situation, patient is subjected to life-long immunosuppressive therapy. Adherence to this prescribed immunosuppressive regimen is crucial to maintain constant plasma concentration thus preventing severe life-threatening outcomes. Mycophenolate mofetil is an immunosuppressive agent used in most solid organ transplant regimens in combination with other agents. MMF is associated with severe gastrointestinal adverse effects which often results in discontinuation of therapy or dose splitting causing non-adherence to the regimen more probable leading to an increase in risks of graft rejections. With a half-life of 8-16 hours, 95% of steady-state plasma concentration is observed after 48 hours leading to significant lag time between administration and therapeutic action. With sustained release dosage forms, the steady-state concentrations can be reached more promptly than immediate release dosage forms and the next doses will help maintain the steady-state concentrations effortlessly. Sustained release dosage forms show release for prolonged period hence reducing the dose frequency of the drug. Of all the sustained release formulations, nano-structured lipid carriers (NLCs) are more preferred due to several advantages such as small particle size, large surface area and modifiable surface. Therefore, formulating NLCs of MMF with sustained release can help reduce the dosing frequency and release the drug for a long time. Sustained release NLCs of MMF was also prepared through high sheer homogenization and ultrasonication process. The developed formulation was found stable and tested for various critical quality attributes exhibiting satisfactory results. Application of Formulation by Design approach was successfully applied for implementation of Quality by Design principles. The present work may offer more suitable drug delivery system of immunosuppressant MMF providing an extended drug release and decrease the pill burden while improving patient's quality of life.

Keywords: Mycophenolate mofetil, NLCs, immunosuppressant, QbD.

DRUG DESIGNING OF NOVEL DERIVATIVES OF CHALCONES

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Abstract

Chalcones are naturally occurring semi synthetic flavonoid compounds chemically they are known as alpha beta hydroxy ketone containing a phenolic ring. The proposed work aims on the development and design of new selected derivatives of chalcones. The derivatives will be designed by using the software:CADD. Chalcones can be synthesized by two processes that are aldol condensation and Claisen schidmt reaction. Reaction conditions for the same are in presence of aldehyde and ketone with Na/Ethanol acting as catalysts, reaction is further carried

by the emergence of beta hydroxy ketone or beta hydroxy aldehyde followed by elimination of water. Here, the reactants are benzoin(ketone) + cinnamaldehyde(aldehyde) and cinnamaldehyde(aldehyde) + camphor(ketone). The designed chalcones might elicit increased pharmacological action and therapeutic effects such as anti-inflammatory, anti-microbial , anti-cancer , anti-diabetic and to treat cardiovascular diseases and various infections.

Keywords: Chalcones, CADD, Therapeutic efficacy.

NANOTECHNOLOGY: A NOVEL THERAPEUTIC APPROACH IN TREATMENT OF CANCER

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Abstract

Cancer, a genetic autoimmune disorder, is a generic term for a set of diseases characterized by uncontrolled, random cell division and invasiveness. From past many years, cancer is responsible for millions of deaths worldwide. This malignant disease features, proliferation of cells that have managed to evade central endogenous control mechanisms. In past decades, many research studies have focused on finding new therapies to reduce the side effects of conventional therapies. The conventional therapeutic approaches used in cancer treatment include surgery, chemotherapy, radiation therapy, targeted therapy, immunotherapy and hormone therapy. Cancers can be characterized on the basis of their organ or tissue of origin, but are also based the molecular characteristics of the respective cancer cells. During the progression of cancer, tumors become highly heterogenous, thereby creating a blended population of cells described by various sub-atomic highlights and different responsivity to treatments. The advent of nanotechnology has reformed the field of malignant growth diagnosis and treatment. Nanoparticles are the particles with one dimension less than 100 nm with unique properties usually not found in bulk samples of the same material. Nanoparticles (1-100nm) can be used to treat cancer due to their specific advantages such as biocompatibility, reduced toxicity, more excellent stability, enhanced permeability and precise targeting. Nanoparticle Drug Delivering System not only overcome the limitations of conventional cancer treatment but also effective against multidrug resistance.

Keywords: Cancer, Autoimmune disorder, Immunotherapy, Nanoparticles.

ELLAGIC ACID AMELIORATES BEHAVIORAL AND BIOCHEMICAL DEFICITS IN MURINE WATER IMMERSION STRESS MODEL OF CHRONIC FATIGUE SYNDROME

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Abstract

Chronic fatigue syndrome (CFS) is a specific clinical condition that characterizes unexplained disabling fatigue. In the present study, chronic fatigue was produced in mice by subjecting them to forced swim inside a rectangular jar of specific dimensions for 6 min. daily for 15 days. Ellagic Acid (EA; 25, 50 and 100 mg/kg, p.o.) was administered daily 30 min. before forced swim session.

Immobility period and post-swim fatigue was assessed on alternate days. On the 16th day, after assessment of various behavioural parameters, mice were killed to harvest the brain. There was significant increase in oxidative-nitrosative stress and tumour necrosis factor-alpha levels in the brain of mice subjected to water-immersion stress as compared with naive group. These behavioural and biochemical alterations were restored after chronic treatment with Ellagic acid. The present study points out that Ellagic acid could be of therapeutic potential in the treatment of chronic fatigue.

Keywords: Chronic Fatigue Syndrome, Ellagic acid, Stress, Depression, Cytokines, Forced Swimming Test.

DESIGN, ADME STUDIES, AND MOLECULAR DOCKING OF 2, 5-SUBSTITUTED 1,3,4-OXADIAZOLE AND 1,3,4-THIADIAZOLE DERIVATIVES AS POTENTIAL ANTIPROLIFERATIVE AGENTS

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Abstract

Molecular Docking, an in-silico computational approach is, now a days attaining popularity due to the study of complex biological system and prediction of binding affinity of drug molecule to a specific targeted site (protein/ enzyme). A library comprises of 2 series having 40 compounds (20 each) of 2-Substituted-3-(5-substituted-1,3,4-Oxadiazol/thiadiazol-2-yl) thiazolidin-4-one derivatives (D-1 to D-40), was designed and screened for anticancer potential using molecular docking studies using Human Thymidylate Synthase Complex (PDB: 1JU6) and Telomerase (PDB:5UGW) proteins, by Schrodinger-Maestro v13.2 as possible drug target. Molecular docking results revealed that analogues D-40 (Docking score=-9.643) and D-20 (Docking score=-8.976) displayed best docking score in each series, respectively against PDB: 1JU6 and molecules D-6 (Docking score =-5.958) and D-1(Docking score =-4.88) displayed best docking score in each series against Telomerase (PDB:5UGW) proteins. Derivative D-3 (Docking score = -8.915) and (Docking score = -5.74) exhibited best docking score respectively against both Human Thymidylate Synthase Complex (PDB: 1JU6) and Telomerase (PDB:5UGW) proteins from the all derivatives with better interaction within crucial amino acid. ADME results revealed all the analogues have significant scores within Qikprop range and also inside the close agreement of the Pfizer's rule of five and these analogues can be used as lead derivatives for the discovery of new anticancer agents.

Keywords: Design, Anticancer, Human Thymidylate Synthase Complex, Telomerase proteins Molecular docking, ADME.

JOURNEY OF A DRUG MOLECULE: FROM RESEARCH TO PATIENT

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Abstract

Drug discovery is a process which aims at identifying a compound therapeutically useful in curing and treating disease. This process involves identification of candidates, synthesis, characterization, validation, optimization, screening and assays for therapeutic efficacy. Once a compound has shown its significance in these investigations, it will initiate the process of drug development earlier to clinical trials. New drug development process must continue through several stages in order to make a medicine that is safe, effective, and has approved all regulatory requirements. One overall theme of or topic is that the process is sufficiently long, complex and expensive so that many biological targets must be considered for every new medicine ultimately

approved for clinical use and new research tools may be needed to investigate each new target. From initial discovery to marketable medicine is a long, challenging task. It takes about 12-15 years from discovery to approved medicine and requires an investment of about US $ 1 billion. On an average, a million molecules screened but only a single is explored in late stage clinical trials and is finally made obtainable for patients.

Keywords: Lead optimization, Clinical trials, Target validation identification, New drug.

MANAGEMENT OF CHRONIC HEART FAILUE

Congestive heart failure (CHF), a disease seen primarily in the older patient, can be due to either systolic or diastolic dysfunction. Management is quite different if the heart failure is due to a filling abnormality as compared to poor ventricular systole. The disorder also poses many diagnostic pitfalls in the elderly. Heart failure (HF) is a progressive clinical syndrome caused by inability of the heart to pump sufficient blood to meet the body's metabolic needs. HF can result from any disorder that affects the ability of the heart to contract (systolic dysfunction) and/or relax (diastolic dysfunction). Clinical Manifestations for both A-Left-sided failure. B-Right -sided failure.

Staging and (NYHA) classification of HF:

Class I - No symptoms and no limitation in ordinary physical activity, e.g. shortness of breath when walking, climbing stairs etc.

Class II - Mild symptoms (mild shortness of breath and/or angina) and slight limitation during ordinary activity.

Class III - Marked limitation in activity due to symptoms, even during less-than-ordinary activity, e.g. walking short distances (20—100 m).Comfortable only at rest.

Class IV - Severe limitations. Experiences symptoms even while at rest. Mostly bedbound patients.

TREATMENT OF CHRONIC HEART FAILURE

-pharmacologic

-Nonpharmacologic

(ACC/AHA) staging system provides a more comprehensive framework for evaluating, preventing, and treating HF.

A IMPERATIVE STEP IN FORMULATION AND DEVELOPMENT: PREFORMULATIONS

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Abstract

Preformulation studies are the first step in the rational development of dosage forms of a drug substance. It is useful for the selection of new chemical entities for preclinical efficacy/toxicity studies which is a major section under investigational new drug application. A strong collaboration between discovery and formulation groups is essential for selecting the right new chemical entities to reduce the attrition rate in the late stage of development. Preformulation begins after a literature search of similar types of compounds to provide and understand (i) the degradation process, (ii) any adverse conditions relevant to the drug, (iii) bioavailability, (iv)

pharmacokinetics and formulation of a similar compound and (v) toxicity. Preformulation influences (a) the selection of the drug candidate itself, (b) selection of formulation components, (c) API & drug product manufacturing processes, (d) determination of the most appropriate container closure system, (e) development of analytical methods, (f) assignment of API retest periods (g) the synthetic route of the API, (h) toxicological strategy. Preformulation studies give directions for development of formulation in choice of drug form, excipients, composition, and physical structure, help in the adjustment of pharmacokinetic and biopharmaceutical properties, and support for process development of drug substance. It also strengthens the scientific foundation of the guidance, provide regulatory relief and conserve resources in the drug development and evaluation process, improve public safety standards, enhance product quality in the fabrication of dosage form. The overall objective of preformulation studies is to generate information useful in developing stable and bioavailable and sustained release dosage forms that can be mass produced. In this review, we are discussing about advantages and value of preformulation studies in drug discovery, formulation, and development.

Keywords: Preformulation studies, Pharmacokinetics, Api, Formulation and development.

PHARMACOVIGILANCE

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Abstract

Pharmacovigilance, according to the WHO, is "the science and actions relating to the detection, assessment, understanding, and prevention of adverse effects or any other drug-related problem,& quot; however it is unclear what these activities; performance qualities are in general. We provide newinsights into the diagnostic potential and characteristics of SDAs that are regularly applied to the US Food and Drug Administration (FDA) Adverse Event Reporting System by utilising a special gold standard that the observational medical outcomes partnership (OMOP) recently made public and by conducting a special systematic evaluation (AERS). Our research demonstrates that not all occurrences are equally detectable, raising the possibility that some events could be monitored more successfully by using different data sources. In order to help with the trade-off between sensitivity and specificity for certain use cases, we present performance guidelines for a variety of operating conditions. The manner that diseases are treated and managed has evolved as a result of modern medicine. Nevertheless, despite all of their advantages, mounting data suggests that drug-related side effects remain a frequent but frequently avoidable source of sickness, disability, and even death. Adverse drug reactions (ADRs) are among the top 10 main causes of death in various nations. Over the past few decades, the assessment of drug safety and benefit-harm balance has been significantly changed by the accessibility of vast databases and computerised automated statistical methodologies. Finding and analysing medication safety warning signs, particularly those involving uncommon and unfavourable drug reactions.

Keywords: Pharmacovigilance, Medicines, Drug.

SPANSULES : A NOVEL APPROACH

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Abstract

Spansules are often measurers as the most advanced type of controlled delivery system among all thedifferent forms of the pharmaceutically formulated drugs as it possesses several benefits over other dosage forms like it have capability of incorporating multiple drugs of molecules of different advantageous therapeutic effects together in the specially designed formulations techniques microencapsulation for potentiating the therapeutic effects at the specific sites. By having wideadvantages in the field of the drugs delivery system it is such formulated that it can be used as both either the first intermediated patterns or the slow-release pattern in order to maintain the constant rate of the drugs release for the prolonged time period. This type of the newly formulated dosage forms works on zero order kinetics to maintain the constant plasma drug concentrations. These spansules are often shown in the form of the capsules in which the medicated granules are filled that are coated with specially designed coating materials that have the property of slowly dissolving of the specific medicaments that must have to deliver at its definite time. Due to these numerous advantageous effectsof the spansules there are many dosages forms prepared on this basis to enhance their therapeutic effects like the introduction of the drugs Nifedipine in the forms of spansules by using the extrusion and spheronization based advanced techniques gives the beneficiary effects in providing the effective controls of the drugs delivery for the time period of about 8hrs.As these spansules can easy be manufacture with advanced therapeutic effects over the conventional type of dosage forms .Thus it will be assume that this delivery systems will become the best multiple delivery systems at one time.

Keywords: Hard gelatin capsules, Controlled release, Microencapsulation, Novel drugs delivery system, Central composite design.

BASICS OF PHARMACOLOGY: A REVIEW

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Abstract

Hippocrates is contemplated as father of medicine who established the utilization of metallic salts in order to medicate ill-health.Paracelsus recognized as grandfather of pharmacology who inaugurate the benefits of chemicals to treat ailments.Pharmacology is the region of pharmacy in which the drug interactions with the organ system are studied including their effects and remedial uses. Extensively, the pharmacology is dissect in two portions i.e. pharmacokinetics and pharmacodynamics. Pharmacokinetics covers the motion of drug in the body and it also include the ADME i.e. absorption, distribution, metabolism and excretion. Absorption is the process in which the drug enters to the bloodstream after administration. Distribution is the procedure in which the drug goes in the various tissues and other parts of the body. Metabolism is action in which the lipophillic components get converted into hydrophilic substances for excretion. Excretion is the process in which the drug emitted from the body irreversibly.Pharmacodynamics comprises the physiological and biological reaction of drug substances on human organ systems. Drug is a material or manufactured chemical product i.e. utilized or administered in the body to medicate, avart or detect ill-health conditions.The other two areas of pharmacology are experimental pharmacology

and clinical pharmacology. Expertimental pharmacology is region which involves the experiments of different medicines on animals and humans in laboratory under controlled conditions. Clinical pharmacology covers the study of impact of drug molecule utilization in community.

Keywords: Drug, Pharmacokinetics, Pharmacodynamics, Experimental pharmacology.

A BRIEF REVIEW ON PATIENT COUNSELLING

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Abstract

"Patient Counselling" by pharmacologist is a manifold and imprecise project. It is also an enterprise which attain additional importance as part of enhancement of the role which is observed as the process onwards for proclamation . It is the operation of display statistics, guide and lieutenant, about medicine consumption either by verbalized or in writen down to the patient. Patient counselling is salient to give correct drug, in fair dose, at proper time, by accurate route and to right patient. Counsellingis achieved for remedial aim. It also assists to keep away from adverse effect and the treatment price. Effectual patient counselling build the patient acknowledge his/her sickness, essential way of living, changes and increase the patient obedience. Exclusively the four type of intractional perspective to conference into a widely explained "patient counselling" series are recognize. These submisssion are noticeable within the broader substructure of fragility, virtue, which effect the exchange of instruction more in a gernal sence. A good counseller having abundant of character like be a good listener, be pliable, be senstive, be neutral and communicate confidently. Good communication adroitness are essential to acquire the patient's conviction and to inspire the patient to attach the propose regimen. The counselling should be held in a semi-private or private area which away from distractions. In the review this postulates that patient counselling is the depiction and thecollection of better remedy. A good counseller provides agreeable surrounding to their patient.

Keywords: Pharmacologist, Medicine, Treatment, Nonlinguistie, Patient.

VACCINE OF DENGUE FEVER

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Abstract

Dengue fever is a tropical disease caused by a virus carried by mosquitoes. Dengue is disease which is now endemic in more than 100 countries of Africa, America, Asia and the western pacific. Dengue is transmitted to the man by mosquitoes and exists in two forms such as Dengue fever and Dengue Haemorrhagic fever. It is caused by four different serotypes of the dengue virus like DEN-1, DEN-2, DEN- 3, DEN-4. The virus may also be transmitted through a female Aedes aegypti mosquito. Mild symptoms of dengue can be confused with other illnesses that cause fever, aches, and pains, or a rash. The most common symptoms are nausea, vomiting, eye pain, muscle, joint, bone pain. Symptoms of dengue typically last 2-7 days. Most people will recover after about a week. As of 2021, one version is commercially available known as CYD-TDV,and sold under the brand name Dengvaxia. The vaccine is only recommended in those who have previously had dengue fever or populations in which most people have been previously infected. The value of the vaccine is limited by the fact that it may increase the risk of severe dengue in those who have not previously been infected .In 2017,more than 733000 children and more than 50000 adult volunteers were vaccinated with CYD-TDV regardless of serostatus, which led to a controversy. In

March 2021, the European Medicines Agency accepted the filling package for vaccine candidate TAK-003,which is designated for people not previously infected . They are other vaccine candidates in development including live attenuated, inactivated, DNA and subunit vaccines.

Keywords: Disease, Virus, Symptoms, Medicines, Vaccines.

HEALTH BENEFITS OF HERBAL TEA : A REVIEW

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Abstract

Herbal teas also known as herbal infusion and less commonly called tisanes are beverages made from the infusion or decoction of herbs, spices or other plant material in hot water. Of times herb tea or the plain term tea is used as reference to all sorts of herbal teas. Today's an estimated 60-80% of the world's population depend on medicinal herbs for their healthcare needs. Herbal teas are widely representated in the field of medicines due to their health-promoting activities like; anticancer, antimicrobial, antidiabetic, anti-inflammatory and antioxidant properties. herbal tea market is growing along with growing health and wellness trend. Herbal teas curing cough and cold, boosting iron in the body, treating insomnia, smoothing stomach issues, maintain proper kidney health, reducing infection, relieving stress, showing anti-inflammatory effects, rejuvenating tissue cell, promoting flawless skin relieving. These teas are beneficial due the presence of anti oxidant compounds and inflammatory compounds. Herbal teas are the primary source of dietary antioxidant in many cultures, of which polyphenolic compounds, in addition to vitamins and carotenoids, have been in focus of the scientific community for the past few decades. The concentration of bioactive compounds and antioxidant effectiveness of herbal teas depend on the plant constituents, preparation method, processing and storages time and condition. The antioxidant activity of herbal teas and herbal teas mixtures is comparable, and often even exceeds the antioxidant effectiveness of black, green and white teas. There are several types of herbal teas in the market like; chamomile herbal tea, peppermint herbal tea, ginger herbal tea, lavender herbal tea, hibiscus herbal tea, butterfly pea flower herbal tea, lemongrass herbal tea, rooibos herbal teas, cota navajo tea, oolong tea, echinacea tea, turmeric tea, red clover tea, yerba mate tea, cinnamon tea. In this review paper health benefits herbal teas has been discussed.

Keywords: Herbs, tea, anti-inflammatory, antioxidant, Infection.

RECENT ADVANCEMENT OF CORNEAL DISORDERS AND SURGERY: A REVIEW

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Abstract

"Corneal disease" refers to a variety of conditions that affect mainly the cornea. Corneal disease is a serious condition that can cause clouding, distortion, scarring and eventually blindness. This disease can produce hazardous effect on human body such as Bacterial, fungal and viral infections. Pain, blurred vision, tearing, redness, extreme sensitivity to light, corneal scarring, allergies is the signs and symptoms of the corneal disease. Aging processes can affect the clarity and health of the cornea, heredity, contact lenses, eye trauma. Diseases and damage to the

cornea is a leading cause of blindness globally but remarkably only one donor cornea is available for every 70 needed. Studies show corneas are procured in approximately 82 countries, with only a few exporting them in large numbers .Last year a study of new wet lab model of DMEK using human corneas mounted on an artificial anterior chamber with an artificial iris aimed to compare the performance time and scores between beginners and experienced anterior segment surgeons. About 53% of the world's population has no access to corneal transplantation. Cultured human corneal endothelial cells as a tissue engineered endothelial graft (TEEK).Human corneal endothelial cells (hCECs) injection therapy, Ipsc converted to CEC, and bioengineered corneal stoma to treat keratoconus, stromal scarring and stromal dystrophies are amid the troves of research taking place into corneal diseases. Bowman layer transplantation and artificial intelligence to treat keratoconus are also among the corneal disease research Daniell is interested in. Gene therapy is another area growing interest, he says, unlocking its potential to treat Fuch's endothelial dystrophy and corneal stromal dystrophies without a transplant.

Keywords: Corneal disease, endothelial cells, human body, keratoconus, gene therapy.

THE ROLE OF TRADITIONAL MEDICINE IN PROGRAMED CELL DEATH

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Abstract

Programmed cell death is a genetically regulated process of cell suicide that is central to the development, homeostasis and integrity of multicellular organisms. The dysregulation of mechanisms controlling cell suicide plays a role in the pathogenesis of a wide range of diseases. Apoptosis is the earliest and most recognized programmed cell death that is regulated by specific signals. Since then, more programmed cell death has been discovered such as autophagy, pyroptosis, ferroptosis and NETosis, etc. Traditional medicines are widely used for programmed cell death because they have lesser side ffects and more efficacious and the substance provide more health benefits. Traditional medicine refers to health practices, approaches, knowledge and mineral based medicines, spiritual therapies, manual techniques and exercises, applied singularly or in combination to treat, diagnose and prevent illness or maintain well-being. In the last decade traditional medicine has become very popular in Cameroon, partly due to the long unsustainable economic situation in the country. Traditional medicines have been used widely used for chronic inflammatory diseases. The active metabolites of traditional medicines in regulating programmed cell death, if they have a specific effect merit a more detailed mechanism – pharmacological approach. The ability of plants to influence programmed cell death in cancerous cells in an attempt to arrest their proliferation has been the topic of much research. Various cell-lines like HL60, human hepatocellular carcinoma cell line (KIM-1), a cholangiocarcinoma cell-line (KMC-1), B-cell hybridomas, U937 a monocytic cell-line, HeLa cells, human lymphoid leukemia (MOLT-4B) cells and K562 cells have been studied.

Keywords: Programmed cell death, traditional medicines, apoptosis, cell death, active metabolites.

TREATMENT OF COVID-19 DISEASE: A HERBAL APPROCH

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Abstract

The Corona virus disease 2019(covid-19) pandemic has caused a worldwide outbreak of respiratory illness. Starting from December 2019, novel corona virus disease 2019(covid-19) pandemic has caused tremendous economic loss and unprecedented health crisis across the globe. While the development of cure is at full speed, less attention and fewer efforts have been spent on the prevention of the rapidly spreading respiratory infectious disease. Most common symptoms include Fever, Cough, Tiredness, Loss of taste or smell, whereas serious symptoms are includes difficult breathing or shortness of breath, Loss of speech or mobility, or confusion, Chest pain. Several plants are used in the treatment of covid – 19 and which are having different actions in the GIT because of stimulation of the production of immune cells that can fight the infection of the covid-19, cidal effects on viruses, preventing rise in the body temperature, preventing inflammation, stimulation of red cell production. These plants are Eucalyplus, Ginger, Garlic, Coca, Matico, Chamomile, Rosemary, Oregano, Lemon balm, Sage, wira wira, panty, thyme, Geranium. The bio active compounds of these plants play important role in the immunity boosting as well as addressing health care issues in covid conditions. Therefore, proper utilization of traditional medicines will be usefull to safe guard the health of the subjects of covid-19. This review aims to evaluate the effectiveness and adverse event of herbal medicines for the treatment of covid-19.

Keywords: Covid-19, cure, pandemic, disease, symptoms, inflammation, health crisis.

NANOTECHNOLOGICAL CARRIERS FOR TREATMENT OF ACNE

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Abstract

Acne is a multifactorial skin disease associated with pilosebaceous unit and caused by bacteria Propionibacterium acnes and Acne vulgaris. Near about 95% people throughout the world suffer from acne at some point in their life span. This disease is more prominent in adults compared to neonates and prepubescent children. Conventionally it is treated with either creams or gels having large number of side effects on patients.

Methods: We searched about recent advancements in the use of nanotechnological carriers for effective treatment of acne. We focused on the use of liposomes, niosomes, microemulsions, microsponge, microspheres, and nanoparticles to improve anti-acne therapy. Patents regarding use of nanocarrier systems to eliminate acne were also discussed in this review.

Results: The encapsulation of anti-acne drugs in various nanotechnological carriers improve their efficacy and reduce side effects. These carriers show controlled drug release and improved drug penetration even upto pilosebaceous unit of skin. Local tolerability of anti-acne molecules can be improved by adjusting the concentration in nanotechnological carriers.

Conclusions: Nanotechnological carriers have opened a new window to design novel, effective and low dose systems for effective eradication acne disease. However, very few nanocarrier based formulations are available in market for topical use and much progress is required in this field to improve anti-acne therapy.

Keywords: Nanotechnology, nanotechnological carriers, drug.

PROSPECTIVE EVOLUTION IN DRUG DISCOVERY TO PATIENT CARE

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Abstract

The transition from preclinical research to clinical phases marks a significant turning point in the development of a new pharmaceutical product. Novel approaches that can enhance patient recruitment, engagement, and retention while promoting clinical trial continuity have been made possible by the rapid shift in clinical trial paradigms. An enterprise strategy should be employed to create a seamlessly integrated, technologically enabled solution that lowers patient burden while developing and implementing clinical trials. Decentralized clinical research produce better findings, which enhance clinical trials. Human genome research has paved the way for the establishment of a unique medical practise paradigm that has the potential to transform healthcare. Selection of these novel approaches will lead to change in Pharmaceuticals further leading to adoption of customised medications based on a patient's molecular profile and marker-assisted diagnostics. The identification of novel targets, the use of toxicogenomic indicators to screen compounds, and improved patient selection in clinical trials will all lead to a drastic restructuring of the pharmaceutical industry. The traditional linear process of drug research and development will be replaced by a heuristic and integrative approach. Treatment for patients will change as a result of the application of novel molecular predisposition, screening, diagnostic, prognostic, pharmacogenomic, and monitoring markers. Despite the many challenges that must be solved, personalised medicine will eventually replace the traditional trial-and-error approach to practising medicine.

CHROMATOGRAPHY- THE SEPRATION OF BIOPHYSICAL TECHNIQUE

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Abstract

Chromatography is an important biophysical technique that enables the separation, identification, and purification of the components of a mixture for qualitative and quantitative analysis. Chromatography proteins can be purification based on the characteristics such as size,shape,total charge, hydrophobic groups present on the surface, and binding capacity with the stationary phase. Chromatography has four separation technique based on the molecular characteristics and interaction type use mechanisms of ion exchange, surface adsorption, partition, and size exclusion. The other chromatography techniques are based on the stationary bed, including column, thin layer and paper chromatography. Column chromatography one of the most common methods of protein purification. Chromatography the mobile phase is always composed of “liquid” or a “gaseous” component. The interaction between the stationary phase and, mobile phase, and the substance contained in the mixture of the basic component effective on the separationon molecules. Chromatography the measurement of the drug levels both in a pharmaceutical industry’s perspective and health care setup is need of the hour. In the analytical technique help them separation later on preclinical or clinical testing accurate measurement of drug levels in biological tissues and suitable analytical techniques. In chromatography the qualitative and quantitative analytical method existing today or more sophisticated and complex, however the review focusses on the various types of chromatography their working principles and application.

Keywords: - Chromatography, Paper chromatography, thin layer chromatography, High performance liquid chromatography.

MASTER FORMULA RECORD(MFR) IN RESEARCH AND DEVELOPMENT

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Abstract

Master Formula Record (MFR), a master document for any pharmaceutical product which contains all information about the manufacturing process for the product. MFR is prepared by the research and development team of the company and all other documents like Batch Manufacturing Record & Batch Packing Record are prepared using MFR. It includes all necessary information and appropriate procedures to safely prepare a non- sterile formulation, whereas the compounding record is generated every time that preparation is compounded with prescription(or Batch-) specific information that must be verified. It is a document or a set of documents specifying the starting material with their quantities and packaging materials, together with description of procedures and precautions required to produce a specified quantities of a finished product aswell as the processing instructions, including the in-process control. There shall be MFR relating to all manufacturing procedure for each product and batch size to be manufactured. This abstract summaries that MFR is required in manufacturing processes so as to reduce errors and get appropriate formations.

Keywords: MFR, Batch Manufacturing Record, Batch Packing Record

QSAR APPROACH FOR PREDICTION OF NEW DRUG DESIGN

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Abstract

Quantitative structure-activity relationship (QSAR) studies remain an attractive approach to the modern drug developmentover the last past two decades. QSAR studies describes relationship between biological activity and molecular properties in terms of physiochemical properties of substitution at certain positions of a drug moiety in order to predictthe activities of new chemical entity. QSAR has been used for several times in order for development of new molecule and better efficacious drug moieties.Nowadays QSAR is also used for finding the drug toxicity and drug incompliance. The better biological drug molecule further undergoes the selection process.Various hypothesis said that 3D- QSAR technique is one of the best techniques nowadays used by the various research organization and researchers. Easy handling is one of the chief features of QSAR technique. In all described articles QSAR study have been proved as a good prediction tool for investigation of drug activity or binding mode on specific receptors.This abstract summarizes that QSAR approaches are able to provide reliable and probable prediction on biological activity of a targeted molecule.

Keywords: Drug Design, Drug Prediction, QSAR, QSPR

USE OF ORANGE PEEL PECTIN AS NATURAL SUPERDISNTEGRANT

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Abstract

Natural Superdisintegrants are agents which aids in disintegration of orodispersible tablets rapidly in mouth without need of water. An orange peel pectin is a sugar which found in the walls of orange plants that can be used as a gelling agent especially in jams and jellies and as natural superdisintegrant for tablets. Many plants contain pectin but orange-peel pectin is economical and can easily be extracted from orange peel. Due to high swelling index it produces instant release of drug which is helpful in the treatment of nausea and vomiting where instant relief is required. Orange peel pectin also provides orange flavour to formulation and mask the unpleasant taste of API. This study suggests that orange peel pectin can be used as superdisintegrant, taste masking as well as flavouring agent in formulation of mouth dissolving tablets. **Keywords:** Orange peel, Natural Superdisintegrants, Pectin, orodispersible

TEA TREE OIL BASED SOLID LIPID NANOPARTICLES: A NOVELAPPROACH FOR SKIN REJUVENATION

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Abstract

Solid lipid nanoparticles (SLNs) are the second-generation nanoparticles and these are composed of liquid and solid lipids. Due to their unique size-dependent properties, they offer the possibility to develop a new therapeutics. Solid lipid nanoparticles are non-biotoxic since they are biodegradable. They are capable to incorporate drugs into nanocarriers, in drug delivery which leads to a new prototype which may be used for drug targeting. Tea tree oil obtained from the leaves of the tea tree (Melaleuca alternifolia) is found to possess antifungal, antibacterial as well as rejuvenating property. When it is combined or loaded into the solid lipid nanoparticles, the formulation may be used as an antiaging composition for topical application due to enhanced surface area and high penetration power of lipidic moiety. Various methods which are used for the characterization of SLNs are size distribution, surface morphology, zeta potential, functionalization etc. Due to their herbal nature it might give lesser side effects and therefore, might give boom in cosmetic industry.

Keywords: Solid lipid nanoparticles (SLN), antiaging, tea tree oil

A REVIEW ON EMULSION-BASED HRDROGEL FORMULATION OF ANTI-INFLAMMATORY

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Abstract

Emulgels, which contain a dual release control mechanism that includes both a gel and an emulsion, have become one of the most intriguing topical delivery systems. The main goal of this formulation is to transfer hydrophobic medications to systemic circulation through the skin. The direct accessibility of the skin as a target organ for diagnostic and therapy is a distinctive aspect of topical medication administration.Emulgel is the name given to the dosage form created by

combining gel with emulsion. Instead of just mixing medications into the gel foundation, this may demonstrate higher drug stability and release. Other cutting-edge methods include niosomes and liposomes, which are nanosized and may leak due to their vesicular architecture, resulting in less effective trapping.But gels have a far higher loading capacity due to their extensive network.Drugs are integrated into globules and disseminated in an emulgel drug delivery system before being combined with the gel basis to create an emulsion. Due to their benefits, such as their greaseless, smooth, homogenous texture, glossy look, transparency, pH comparable to skin's pH, high drug content, and sustained release, emulgels have been found to be superior topical drug delivery systems to others. This review article discusses emulgels, highlighting their characteristics, formulation concerns, and characterization criteria, demonstrating why they are among the most efficient and practical drug delivery systems.

Keywords: Emulgels, dual release control, Drug delivery system.

EMULGEL: AN ADVANCE CARRIER FOR OLEOPHILIC DRUGS IN CURRENT SCENARIO

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Abstract

Topical drug delivery can be defines as good delivery system for drugs, in which drug directly get interact with skin and give its pharmacological effect to desired site to cure and treat variety of disorder. Gel has major disadvantage because it cannot prepare for hydrophobic drugs as well as emulsion cannot prepare for hydrophilic drugs, this type of limitation can be defeated by emulgel. Emulgel have dual property like emulsion and gel and gives dual release system.. Emulgel gives a good advantage over gel that hydrophobic drugs are easily dissolve in oil phase and then added in aqueous phase to form w/o type emulsion. These emulgel then incorporate into gel to form emulgel. Emulgel are good carrier for topical delivery of lipophilic drugs and have sseveral advantages over different drug delivery system. Emulgel gives better patient compliance and higher aqueous component to promote greater dissolution of drugs. Controlled pattern drug delivery system is the major success of emulgel due to presence of cross linked structure of gelling agent. Emulgel formulations are beneficial for its potential in analgesic, antifungal, acne, skin disorder and anti-inflammatory etc.

Keywords: Emulgel, Lipophilic, Analgesic, Antifungal, Anti- inflammatory

DANGUE: CAUSE AND PREVALENCE

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Abstract

Dangue is an arboviral disease caused by dengue virus symptomatic dengue infections caused a wide range of clinical manifestations from mild dengue fever (DF) to potentially fatal disease, such as dengue hemorrhagic fever (DHF) or dengue shock syndrome (DSS).Each year , there are 50 million dengue infection and 50,0000 individuals are hospitalised with dengue hemorrhagic fever (DHF).

Keywords: Dengue, causes, symptoms, clinical manifestation.

USE OF HONEY AS A MEDICINE

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Abstract

Natural product is a natural compound or substance produced by a living organism that is found in nature. Natural product can also be prepared by chemical synthesis and have played a central role and the development of field of organic chemistry by providing challanging synthetic targets. The definition of natural products is usually restricted to organic compounds isolated from natural sources that are produced by the pathways of primary or secondary metabolism. Honey is a natural product formed from nectar of flowers by honeybees (Apis mellifera; Family: Apidae. Honey is a viscid and sweet secretion stored in the honey comb by various species of bees, such as Apis mellifera, Apis dorsata , Apis florea, Apis indica and other species of Apis. In addition to its use as a natural sweetener, honey is used as an anti-inflammatory, antioxidant and antibacterial agent. People commonly use honey orally to treat coughs and topically to treat burns and promote wound healing. Honey contains many enzymes that aid digestion and it is a mild laxative.

Keywords : Honey, Apis dorsata, Apis mellifera.

DRUG DISCOVERY AND DEVELOPMENT

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Abstract

New drugs are continually required by the healthcare systems to address unmet medical needs across diverse therapeutic areas, and pharmaceutical industries primarily strive to deliver new drugs to the market through the complex activities of drug discovery and development. Discovery involves a number of processes like target identification and validation, hit identification, lead generation and optimization and finally the identification of a candidate for further development. Development, on the other hand, includes optimization of chemical synthesis and its formulation, toxicological studies in animals, clinical trials, and eventually regulatory approval. Both of these processes are time-consuming and expensive and currently the industry is under pressure owing to the extremely stringent regulatory requirements, environmental concerns, and reduced incomes due to patent expirations. These issues have had an adverse bearing on the R&D productivity in recent years, hence there is a need for innovative approaches as well as increased collaboration between industry, academia, and governmental research institutions, with a common objective of constantly delivering quality medicines. This chapter will look at the preclinical discovery stage in detail along with highlighting the development processes. Additionally, it will also touch upon the issues faced by the pharmaceutical industry and the newer approaches which have the potential to ensure the future sustainability of the pharmaceutical industry.

Keywords- Drug discovery and development