NATIONAL SEMINAR ON

"RECENT ADVANCES IN ANTIVIRAL DRUG DESIGN, DISCOVERY & DEVELOPMENT"

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Foreword

I have great pleasure in compiling, editing and presenting the abstracts of National Seminar on NATIONAL SEMINAR ON "RECENT ADVANCES IN ANTIVIRAL DRUG DESIGN, DISCOVERY & DEVELOPMENT" JUNE 8th & 9th 2018 , We are sure that this publications will enable participants and delegates attending the national seminar to read the abstract of research papers well in advance and participate more effectively in the discussions during the session and also useful for further research activity. This National Seminar has five different technical sessions. We are very thankful to all the presenters who had spared their valuable time in preparing the papers and mailing the abstract in time and also thanks to all participants. This publication is yet another milestone to the wealth of information on antiviral drug design, discovery and development brought by Antiviral Research Society and Kalasalingam University from time to time. We place on record our gratitude and thanks to all the dignitaries who have blessed the seminar through their messages which are included in this publications. We are grateful to our beloved Dr Babuji for involving us in editing the abstract. Our Sincere thanks are due to Mrs. K.C.Palanisamy for his continued support, encouragement and appreciation. Special thanks to management for their help extended at all the stages.

Dr. P. Selvam

Organizing Secretary

Antibiotic New Drug Discovery

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The discovery of penicillin revolutionized the treatment of infectious diseases from 1942 onwards and resulted in major reduction in mortality over next decades. Several new antibiotics emerged after the introduction of penicillin in the market, saving millions of soldiers from Second World War and billions of people across the world. Within a decade of introduction of penicillin for human use, the phenomenon of multiple drug resistance (MDR) towards many antibiotics was found to occur across several regions. In order to combat the drug resistant organisms, the drug discovery research had invented in many new classes of beta-lactam antibiotics, viz., structurally modified penicillins, cephalosporins, oxacephalosporins, and carbapenems. A new class comprising beta-lactamase inhibitors was introduced to prevent the antibiotics from being cleaved by enzymes released by microorganisms as self-defence. Cephalosporins have wide range of structural features, comprising of five generations starting from first generation to the recently introduced fifth generation, acting against gram positive pathogens to gram negative and multi drug resistant pathogens. Despite introduction of hundreds of beta-lactam antibiotics to fight against wide varieties of microorganisms, multiple drug resistance also was found to be acquired by the pathogens rapidly and within few months of introduction into human use. In addition, approval of antibiotics in the last couple of decades has come down, making it a challenge to manage the disease. The multi drug resistant organisms make all the available antibiotics ineffective with the release of enzymes which can cleave the beta-lactam rings of wide variety of antibiotics. It has been a fast growing threat to the antibiotic treatment, resulting in the US Food and Drug Administration to introduce special incentives to innovations through GAIN Act, and QIDP designation of new chemical entities which can act on drug resistant microorganisms. The session will focus on the evolution of antibiotic discovery, challenges and the directions towards repositioning sustainable antibiotic treatment.

Drug Discovery and Development from Natural Products

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The current difficulties in drug discovery and development were the extension for the pharmaceutical industries and the technical limitations in identifying the lead molecules, responsible for the desirable activity. The complexity of the therapeutic agents depends on the type of the synthetic compounds, as the complexity increases there may be the chance of risking the potential hazards in the preparation of new chemical moieties. Upon the over view of the natural products from the traditional medicinal plants to the cutting edge of the new molecular techniques, over the past decade human resources have been enormously relied on the mother nature.

The herbal drug discovery and development includes the **leads from the natural products** like possessing the anti-cancer activity, osteoporosis activity, immunomodulatory agents for the treatment of Leishmaniasis, *in vitro* screening of the bioactive compounds, the forensic significance of the toxic compounds and many more. The **herbal drug research** includes the digitization of traditional knowledge, herb drug interaction, prebiotics, techniques and technologies for the bio discovery of the lead molecules for the traditional and folk medicine, ethnopharmacology and bioprospecting of medicinal plants and finally bioactivity guided fractionation.

The advent of combinatorialchemistry raised the hope in the world of drug discovery, the new chemical molecules on combination with the natural products can be either sourced through chemical synthesis or can be isolated from natural products through biological activity guided fractionation and the sources can be abundantly obtained from natural products. The alternative approach like herbal drug discovery hits the multiple targets based on the potent consideration of the needs of both the common man and the pharmaceutical industries. Hence, the strategy explains in minimizing the risk of post-marketing withdrawals.

A novel Bioadaptive Materials for Antiviral & Drug delivery applications.

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Current scenario, a new generation of bioadaptive materials are attracted towards the antiviral and drug delivery applications. Bioadaptive materials are a simple, inert material having specific combinations of exclusive properties that do not produce any toxic effects. Recently environmental biosafety materials like, nanocomposite materials, drug loaded hydrogel, metal organic frame work, carban nanotubes are played important role for antiviral / drug delivery applications.Many reports are available for antimicrobial activities of silvernanoparticles. The use of metal nanoparticles as an antiviral therapy. The antiviral activity of silvernanoparticle against HIV, hepatitis B virus, herpes simplex virus, respiratory syncytial virus, and monkey pox virus also reported. The silver nanoparticles are directly binds to the viral envelope glycoprotein and inhibit the penetration of virus into the host cell also preventing the replication of virus. The sizes of silver nanoparticles are less than 10nm, it acts as a effective virucidal agent for preventing the viral replication. The silver ions are tightly binds to the sulfhydral group of viral protein and suppress the TNF- α and rapidly inactivate the HIV in short time.

In my present work mainly focuses on the development of polymer/ Ag coated nanocomposite for antiviral and drug delivery applications. The drug loaded silver nanoparticles were synthesized from bioflavonoid quercertin. Viruses which commonly respond to flavonoids Adenovirus, herpes simplex virus, Japanese encephalitis virus. The drug loaded nanoparticle will be used as an antiviral agent.

Last few years significant progress was observed in drug delivery system. The new kind of materials carbon nanotubes, metal organic frame works and quantum dots are acts as a novel carrier for targeted drug delivery. The anticancer drugs doxorubicin (DOX) are loaded into polymeric nanoparticles and targeted for drug delivery applications. In my current research work a novel Ag/Carrageenan–gelatin hydrogel hybrid nanocomposite was prepared and further the drug delivery applications will be carried out further.

Formulation and Evaluation of Topical Gel with Green Synthesized Zinc Nanoparticle from *Murraya Koenigii* leaf extract and its antimicrobial activity

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This earth is made with an amazing environment, whereas microorganisms are widely distributed in different habitat environment and they can be found almost everywhere. Microorganisms are interlaced tightly with all living things which can influence its residents in all aspects. Microorganisms have the ability to transmit and acquire resistance to drug substance genetically due to its specific association during the repeated treatment between antibiotics and microorganisms.

The aim of the present work was to evaluate the phytochemical composition of *Murraya Koenigii*, green synthesis of zinc nanoparticle and to develop herbal topical gel formulation for antimicrobial treatment. Based on its antibacterial activity, *Murraya Koenigii* is selected and assessed for its phytochemical composition. Phytochemical analysis revealed phytoconstituents such as alkaloids, flavonoids, phenols and tannins are present in the extract. Zinc nanoparticle was synthesized using zinc acetate solution from the extracts of *Murraya Koenigii* and confirmed by UV spectroscopy. The synthesized zinc nanoparticles were stable, spherical shape with average particle size of 225 nm and the polydispersity index was found to be 0.256. Synthesized zinc nanoparticles was incorporated into gel base and evaluated for its physical properties such as pH, viscosity, spreadability and antibacterial activity against gram +ve organisms (*Bacillus subtills* and *Staphylococcus aureus)* and gram -ve organisms (*Klepsiella species* and *Pseudomonas aeruginosa*). Developed formulation has uniform color dispersion, free from fibers, no lumps has easy spreadability and washability, with the pH 6.53 and shows antimicrobial activity against both gram + ve and gram –ve bacteria. Our study results conclude that zinc nanoparticle of *Murraya Koenigii* in aqueous gel-base is an effective antimicrobial topical gel formulation.

Chirality @ work in drug research and therapy

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Chirality is widespread in nature and is fundamental to life. It arises from straightforward geometry - any object that lacks inverse symmetry can exist in two distinguishable mirror images, called enantiomers. For example, our hands are chiral: the right hand is an enantiomer of the left hand, and neither can be superimposed on the other by translation or rotation.

The inherent chirality of living systems dictates extraordinary specificity in the recognition of chiral molecules, so that a molecule and its mirror image, whether it is a pharmaceutical, an insecticide, an herbicide, a flavor or a fragrance, will almost always elicit different biological effects. Today it is well documented that the component enantiomers of a racemic therapeutic differs wildly in their pharmacokinetic, pharmacodynamic and toxicological profile. This awareness is fuelled by the exponential explosion of chiral technology in the area of asymmetric synthesis and enantiospecific analysis, particularly in the area of chromatography. As a consequence of the advances in chiral technology, new drug development is focusing on single stereoisomers and the development of racemic mixtures will require scientific justification. Indeed, several pharmaceuticals currently marketed as racemates are undergoing re-evaluation as single isomer products, chiral switches. Thus today chiral technology exerts a strong influence on drug discovery, design and development.

Chirality penetrates into all the disciplines of pharmaceutical sciences including medicinal chemistry, pharmaceutical analysis, pharmaceutics, pharmacology, drug therapy and pharmacy practice.

During the presentation the following aspects will be discussed:

1. Chirality concepts
2. Chirality in drug research and therapy
   - Chiralty in drug action and disposition
   - Chiral switches (A new era of therapeutics)
   - Chiral drugs and regulation
   - Chirality and clinical relevance
3. Chirality @ work in antiviral drugs - Case studies

The entire effort is to create awareness and highlight the prominence of chiralty in drug research and therapy among the academia. Further, the presentation is intended to motivate and invite pharmaceutical scientists to pursue research in chiral science. For chiral drugs a mirror-image perspective in drug therapy is vital and valuable to ensure that the left hand knows what the right hand is doing.

HIV/SIV Pathogenesis: Cross-talk between hNup 153 and SIV Vpx

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Lentiviruses belong to retroviridae family and are characterized by presence of viral accessory proteins with a long incubation period during their pathogenesis. Nuclear import of viral viral gemone known as preintegration complex (PIC), is a challenging task for virus as size of PIC (diameter ≃56 nm) outfits to pass through central pore (diameter 45 nm) of nucleopore complex (NPC). However, unique ability of lentiviruses to infect non-dividing cells suggest their ability to hijack cellular transport machinery by modulating NPC proteins. Several studies suggest that viral proteins such as Matrix (MA), Vpr/Vpx, Integrase (IN), which are present in PIC play am important in the nuclear transport of PIC but the mechanism(s) is not known. Results from the current investigation indicate that SIV Vpxdirectly interact with human Nup153. Deletion mutagenesis analysis clearly demonstrates that serine (63, 65) and tyrosine (66, 69 and 71) residues in Vpx and amino acids between domains 610 to 869 of Nup153 were found to be important for interaction between these proteins. Further, Nup153 interaction with Vpxis conserved among other HIV-2/SIV strains. Surprisingly, Vpx proteins consisting conserved serine residues (S63, 65) were able to interact with Nup153. These data suggest that phosphorylation may play an import role in interaction between Vpx and Nup153. Super Resolution-Structured Illumination Microscopy (SR-SIM) based imaging indicate the change in NPC dynamics during Vpx interaction with Nup153 and further suggest that there could be different ways of protein import, primarily based on type of interaction between Vpx and Nup153. In summary, our data provides new insight on the mechanism of Vpx mediated nuclear import of viral DNA in non-dividing cells.

Plant Taxonomy to Plant Ribosome Inactivating Protein – A Decisive Research

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Floristic research of North Arcot District from 1984 to 1988 had led to a compilation of 928 species, describing of a new fern species, 4 new records to the Eastern Ghats and additions of a few rare species. During that course, ethnobotanical research helped to compile medicinal data of 104 species wherein 54 species presented in the Indian Botanical Society Conference in 1986 had bagged Best Paper Award. Increasing research on floristic survey and medicinal plants has helped to compile data on Marudhamalai Hills of Coimbatore District, Medicinal Plants Conservation Areas (MPCAs) of Alagarkovil and Kolli Hills and ethnobotany of the Palliyans in the Sivagiri Hills of Tirunelveli District. Three new species, one new addition to the Indian Flora and rediscovery of endemic and threatened plants and biochemical analysis of seeds for 5 legumes have been resulted. Recognizing the potential of identifying plants in the field itself had helped to get a FREEP (Forestry Research Extension and Education Project) sponsored by the World Bank on the ethnobotany of the Kanis in the Kalakkad-Mundanthurai Tiger Reserve. It is an eye-opener where I could muster to courage to carry out research on phytochemistry, antimicrobial studies and pharmacology. Intensive research has facilitated to publish 9 nine new species and two varieties taking the total to 12 new species and two new varieties, rediscovery of 8 endemic and threatened plants, publication of new uses of plants not recorded in earlier literature for 299 plants curing 169 diseases anduses of plants recorded in earlier literature for 87 plants curing 65 diseases, phytochemical analysis of 5 ethnomedicines, antimicrobial activity of 2 medicinal plants, antibacterial activity of 2 species and 6 bioactive compounds, phytochemical and antimicrobial studies of 10 medicinal plants, antioxidant activity of 2 medicinal plants, anticonvulsant and CNS depressant activity of *Tribulusl anuginosus*, anti-inflammatory activity in *Jatrophat anjorensis*, *Cyclosorus parasiticus* and *Chamaecrista nigricans*. Anticancer activity of baurenol, a triterpenoid, isolated from *Suregada angustifolia* has been published. Isolation of bioactive compounds and ribosome inactivating proteins (28-34 KDa) has kindled me to carry out research to develop anticancer and antiviral drugs. Anticancer activity has been scientifically proven by cell line and animal studies. Micropropagation of 4 plant species has helped to produce bioactive compounds and propagate and conserve 2 endemic and threatened plants.

Inhibitory effect of Antiviral Drug Acyclovir on Breast Cancer Cells MCF-7 & MDA-MB- 231 - A Drug Repurposing Approach

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Introduction: Drug repositioning has been growing in importance in the last few years as an increasing number of drug development and pharmaceutical companies see their drug pipelines drying up and realize that many previously promising technologies have failed to deliver 'as advertised'

Current cancer therapy includes the use of chemotherapeutic agents, surgery and radiation therapy. It is estimated that four types of viruses [human papillomavirus (HPV), hepatitis B (HBV), hepatitis C (HCV), and Epstein–Barr virus (EBV)] alone could cause 12% of cancer cases worldwide. Investigation of the virus associated cancer serves as a unique platform for the development of novel strategies to prevent the development of infection that can predispose tumorigenesis. Studies on antiviral drug treatments demonstrate promising results on the prognosis through the prevention of carcinogenesis. This **concept triggered** the **idea** of **repurposing** the **antiviral drug acyclovir** for **breast carcinoma**.

Objective: The objective of the study was to repurpose Acyclovir by evaluating its morphometric, cell cycle arrest and migratory features on the breast cancer cell lines.

Key Findings: The cytotoxicity studies were carried out with acyclovir, cisplatine and combination of acyclovir + cisplatine. The MTT assay results indicated the promising activity of the drugs/combinations tested against MCF-7 and MDAMB-231 cell lines. The acyclovir showed IC_{50} of 3.16 ± 1.10 µg/ml and 3.85 ± 1.54 µg/ml respectively with selectivity index of 33.46 and 27.46. To confirm the ability of the single cell to grow into a colony the clonogenic assay was performed. The platting efficiency was found to be 52.30 % and the survival fraction (SF) in cells treated with drug at lowest concentration (0.25µg/ml) was 1.31 %. This indicates the potential anti-metastatic effect of the acyclovir. The advanced studies like DNA fragmentation and Cell Cycle analysis were carried out. The accumulation of cells in at G2/M phase phase is an indication of cell death by apoptosis.

Conclusion: To conclude, we present evidence that ACV has an anti cancer effect on breast cancer cell line. The study shows that ACV was able to inhibit cancer cells proliferation, colony formation ability and cell cycle arrest at G2/M phase, while having no effect on the normal cells. These results provide new insights on the effect of antiviral agents on the tumorigenesis and metastasis. However, more research is necessary to identify the primary target of acyclovir and maximize its potential as cancer drug.

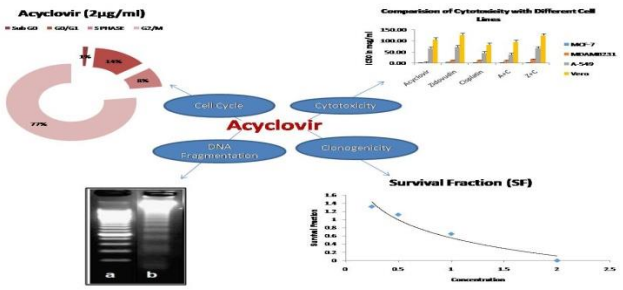

Figure 1:
Anticancer activity of Acyclovir with different assays – Cytotoxicity studies by MTT; *In vitro* cell survival by Clonogenic assay; DNA fragmentation and Cell cycle analysis

Bioactive Natural Products and their Analysis.

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Bioactive natural products are proving to be a rich source of novel therapeutics to protect against and combat diseases, as well as serve as lead compounds in crop protection. A natural product is a chemical compound or substance produced by a living organism that is, found in nature. In the broadest sense, natural products include any substance produced by life. Natural products can also be prepared by chemical synthesis (both semisynthesis and total synthesis) and have played a central role in the development of the field of organic chemistry by providing challenging synthetic targets. The term natural product has also been extended for commercial purposes to refer to cosmetics, dietary supplements, and foods produced from natural sources without added artificial ingredients. Within the field of organic chemistry, the definition of natural products is usually restricted to mean purified organic compounds isolated from natural sources that are produced by the pathways of primary or secondary metabolism. Natural products sometimes have therapeutic benefit as traditional medicines for treating diseases, yielding knowledge to derive active components as lead compounds for drug discovery.

Computational Drug design in selective inhibitor design for potential cancer targets.

R.Raghu,

Vice President, Schrodinger

Today computational techniques play a critical role in pharma R & D. Thanks to recent advancements in understanding the biology, growth in vast amount of Protein Structures which led to developments in Structure based drug design. Computational techniques are widely adopted in understanding the structure function relationship and for screening millions of molecules for lead identification and optimization. In the recent years many techniques has emerged in Docking methods, binding energy prediction methods, Understanding the thermodynamics behind protein ligand interaction and in modeling the proteins etc.

Present work focused on these recent development in computational methods and a case study on how these computational techniques helped in narrowing down to few hundred molecules from data base of millions of compounds. How we selected the leads, how we expanded from few molecules to millions of potential analogs using virtual combinatorial methods. The presentation also covers on lead optimized methods and designing selective molecules towards their target. The presentation will also cover the binding affinity calculations etc. The target proteins are few potential Anti cancer targets.

Structural And Inhibitory Perspective Of Dengue Ns2b-Ns3 Protein

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The mosquito-borne dengue virus has become endemic to many countries and the mortality rate is increasing day by day. Based on the antigenicity dengue virus has been classified into four serotypes (I to IV). The antiviral drugs in the market has no effect on dengue hence need for new drug to cure dengue is necessary. The dengue viral protease NS3 with NS2B as a cofactor which aids in the replication of viral proteins has been identified as a plausible drug target. In this study the small molecules from selective medicinal plants were chosen and the potent inhibitor of NS2B-NS3 protease is selected through Insilico studies such as Molecular docking and Molecular dynamic simulation. Mangiferin, a representative C-glycosyl xanthanoid which shows potent antiviral activity is taken as a potential lead compound and invitro studies have been conducted. The NS2B-NS3 protease was expressed and purified. Crystallization of NS2B-NS3 protease of DENV I with inhibitor Mangiferin was done and primary crystals were obtained. The interaction between NS2B-NS3 protease and Mangiferin was studied using biophysical techniques such as fluorescence spectroscopy and circular dichroism. The kinetic analysis was done using surface plasmon resonance. These studies have suggested that the Mangiferin is binding to the active site region of NS2B-NS3 protease.

Computational Protein Design And Protein-Ligand Interaction Studies For The Improvement of organophosphorus Degrading Potential of Deinococcus *Radiodurans*

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Organophosphorus hydrolase enzyme involve in the catalyzing the hydrolysis of organophosphate toxic compounds. An enzyme from *Deinococcus radiodurans* is reported to be homologus to phosphotriesterase and show activity against organophosphate. In the past activity of this enzyme is found to be low and efforts were made to improve the activity by experimental mutation study. However only very few organophosphate were tested against very few catalytic site mutations. In order to improve the catalytic power of the organophosphorus hydrolase enzyme we carried out systematic functional hotspot based protein engineering strategy. The mutants were tested against 46 known organophosphate compounds using molecular docking study. Finally, we carried out extensive molecular docking studies for the prediction of 46 organophosphate compounds to wild and mutant organophosphorus hydrolase enzyme. At the end we are able to improve the degrading potential of organophosphorus hydrolase enzyme against organophosphate toxic compounds. This preliminary study and the outcome would be useful guide for the experimental scientist involved in the bioremediation of toxic organophosphate compounds.

Keywords: Organophosphate, Mutation; Protein design; Molecular docking; protein-ligand interaction; library design; Computational study

Polarization of Immunity during Hsv Latency

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ABSTRACT:

Herpes simplex viruses (HSV) cause significant morbidity ubiquitously. HSV type 1 (HSV-1) causes herpes labialis and HSV type 2 (HSV-2) causes herpes genitalis. Other complications are herpetic whitlow, keratitis, eczema herpeticum, neonatal herpes and herpes encephalitis. Among immunocompromised and untreated individuals HSV infections could be fatal. Both HSV-1 and 2 are STD pathogens. Upon primary infection, HSV enters the nervous system through nerve endings. After the entry the virus travels centripetally to dorsal root ganglion where it becomes latent. Normally HSV-1 harbors in trigeminal ganglion and HSV-2 in the lumbo-sacral ganglion. Once the virus becomes latent it shuts down all its genes except LAT gene. LAT is a non coding RNA. It has been reported that LAT consists of 6 miRNA ranging from miR-H1 to miR-H6 and these miRNA suppress the HSV reactivation. Upon insult by host factors, the virus reactivates and travels centrifugally in the motor neurons and causes multiple painful circular lesions. Herpes latency especially the mechanism of establishing latent (almost inert) infection and development of recurrent episodes of infections are all interesting phenomenon. From the virus point of view latency provides HSV a survival advantage and protects from the constant immune pursuit. Though it is obscure it has been postulated that conditions such as stress, catamenia (menstrual cycle), fever, exposure to sunlight, and trauma either alone or by combination of multiple factors is believed to be cause of reactivation and recrudescence. Here we propose that a decrease in normal Th-1 cytokine micro environment and the antibody sequelae may contribute as one of the predisposing factors of HSV reactivation.

Prospects of Medicinal Plants for Human Wellness

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Plants are valuable source of a vast array of bioactive compounds such as flavours, fragrances, pigments, natural sweeteners, industrial feedstock, hydrocarbons, antimicrobials, pharmaceuticals, etc. Importantly, higher plants accumulate more than 1, 00,000 secondary metabolites and most of them medicinally or commercially useful. Around 2,500 plant species have already been pharmacologically screened, which resulted in identification of various bioactive molecules with diverse therapeutic activities. Moreover several such molecules have been commercialized as drugs for the treatments human diseases and disorders. Traditional ethnobotanical knowledge is highly valuable source for identification of medicinal plants and development of herbal drugs. Therefore, systematic surveys have been carried out on the ethnic uses of herbal plants by tribes and traditional healers in the Eastern and Western Ghats regions of South India and the details were documented. Totally 89 medicinal plants samples were collected and studied their bioactivities scientifically using *in vitro*, *ex vivo* and *in vivo* experiments. Interestingly, many of the plants have showed remarkable antibacterial, anticandidal, antifungal, antisnake venom activities. In addition, cytotoxicity and wound healing activity were also been determined with some of the medicinal plants. Our completed and ongoing research projects on medicinal plants have shown promising bioactivities and hence, it is worthwhile to investigate further to identify useful bioactive molecules.

Vaccine production in plants with *agrobacterium* and plant viruses

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Virus-like particles (VLPs) mean, the virus capsid protein forms a particle without having its genetic material inside. VLPs categorized into nano particles due to their size and they have huge applications in medicine and material science. Plant viruses and model plants like *Nicotiana* could serve as a platform to produce vaccines. Vaccines are commercially made by expression of proteins or protein subunits in bacteria, yeast, insect cells or mammalian cells. Post-translational modification of proteins in bacteria is not similar with eukaryotic cells, having issue of vaccine production that does not induce immune response efficiently. Other systems have the problem of possible contamination of human pathogens during large scale production. Besides, transportation of purified vaccines from one country to another country needs refrigeration and cold storage units which may not be possible for many developing countries. Plants offer better system as it is easier and cheaper to produce vaccines and there is no need of preservation with freezers.

Agrobacterium tumefaciens is being used for transient and stable transformation for many years. It is being used for the technique called agroin filtration which leads to transient expression of genes in the leaves. Model tobacco plants like *Nicotiana benthamiana* that are very much susceptible to *Agrobacterium* and virus infection, are used for VLP production in plants. It involves genetic engineering of plant virus coat protein to introduce foreign protein or its subunit that triggers immune response. This recombinant gene is introduced in binary vector system of *Agrobacterium tumefaciens*.

Agrobacterium having recombinant gene is vacuum infiltrated in tobacco leaves for transient expression and the protein is purified from the leaves after 4 days by density gradient centrifugation or membrane chromatography. VLPs can be produced in plant either by transient or stable expression of foreign genes.

VLPs have been developed for viruses like Norwalk virus, papilloma viruses, Hepatitis-B and HIV-1 virus and found out that immune response is induced very well in tested animals and human trials. Two VLP vaccines are currently available in the market. VLPs made from Human papilloma virus made in yeast cells and H5N1 influenza virus made in insect cells are in market. Production of similar VLPs in plants are very much cost effective. Plant viruses such as Tobacco mosaic virus, Cow pea mosaic virus, Alfalfa mosaic virus, red clover mosaic virus and other virus coat proteins are being used to engineer the coat proteins to develop new vaccines.

Designing and Applications of Prodrugs

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Traditionally lead compounds used to be selected based exclusively on target activities. Little attention is paid to physicochemical & pharmacokinetic behaviour of the potential needs. In recent years, however the latter two areas have been included in the lead selection criteria and in industrial setting, particularly in the New Drug Development section, Regulatory authorities consider the prodrug of a lead compound as New Chemical Entity (NCE). As a result already performed studies done for the lead compound are to be repeated for its pro-drug also which incurs a lot of expenditure & wasting of time. This could be avoided if only the prodrug concept is included as an integral part of Drug Design process.

Rational Prodrug design:

It consists of three basic steps:

1. Identification of the Drug Delivery problem, 2. Identification of the physicochemical properties required for maximum efficacy or delivery, 3. Selection of a transport moiety, 4.a prodrug derivative being synthesized with proper physicochemical characteristics so that the resulting drug is cleaved in the desired biological compartment.Prodrug synthesis may be used to deal with pharmaceutical or pharmacokinetic issues.Pharmaceutical issues include unpalatability, formulation of 1.V dosage form, pain on injection, and gastro intestinal irritation, pharmacokinetic problems include improving tissue penetration by altering lipophilicity or solubility for 1. Better absorption and access to site of action, 2. Reducing presystemic metabolism leading to greater bio availability, 3.Obtaining selective transformation for targeting a drug to a specific site and thereby avoid toxic effects to other organs and 4. Altering the rate of onset or duration of action of drugs.

Applications of prodrug approach:

Most of the applications are aimed

1. To improve drug formulations, enhancing biomembrane transport and bioavailability and increasing site specificity (Tissue selectivity).
2. To achieve Site specific drug delivery(Targeted drug delivery)
3. To achieve Site directed delivery to the brain
4. To achieve Macromolecular transport
5. Site specific bio activation
6. P^H Dependent bio activation

Thus, prodrug approach offers a wide range of options in drug design and delivery for improving the clinical and therapeutic effectiveness of drug. In human therapy prodrug designing has given successful results in overcoming undesirable properties like absorption, nonspecificity, and poor bioavailability and GI toxicity. A combination of prodrug concept & formulation would obviate many problems encountered in drug delivery process.

Some examples of prodrugs:

Conversion of prontosil to sulfanilamide, imipramine to desipramine and phenacetin to paracetamol are good examples of prodrugs. Acetanilide is hydroxylated to biologically active acetaminophen. Aspirin is converted to salicylic acid during biotransformation.

chloramphenicolpalmitate (meant for pediatric syrup) and chloramphenicol sodium succinate (meant for injection) are prodrugs of Chloramphenicol and Fosfestrol is for diethyl stilboesterol and Kanamycin pamoate for kanamycin and so on.

Antiviral prodrugs:

Valacyclovir, a water soluble aminoacid ester prodrug of acyclovir has been reported to increase the oral bioavailability of acyclovir. Valganciclovir is aaminoacid ester prodrug of Ganciclovir (oral bioavailability of Valganciclovir is greater than Ganciclovir). Other antiviral prodrugs recently introduced with improved oral bioavailability include Penciclovir, famciclovir, Oseltamivir, Cidofovir, adefovir and tenofovir and so on.

Poster

In vitro anticancer activity of chloroform extract of *Tarenna asiatica* (L.)

R.Mounika, J.Selvi, Mohamed Riyas, Mohamed Aqil, D.Vignesh, Dr.B.Geetha

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Plant-derived compounds have played an important role in the development of several clinically useful anti-cancer agents. The present study was aimed for the phytochemical and *invitro* anticancer activity of the selected plant *Tarenna asiatica* (L.). The plant has been used traditionally for treatment of a number of diseases. Previous works were reported for various extracts and different parts which showed potent biological activities. In the present study, the chloroform extract of the whole plant was prepared by cold maceration method. Phytochemical analysis and TLC studies were carried out for the presence of phytoconstituents. The *in vitro* anticancer studies were performed by DLA and EAC models. The results showed that the chloroform extract of *Tarenna asiatica* (L.) showed potent activity against both the models. Hence, the present study may be further extended for the bioactivity guided isolation of the phytoconstituents**.**

Design and Synthesis of Biogenic Silver Nanoparticles from Ethanolic Fruit Extract of *Ziziphus mauritiana* Lam. and Exploration of Its Antibacterial Activity

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Ziziphus mauritiana (Rhamnaceae) is a renowned medicinal plant called **Elanthai in Tamil.** Fruits of this tree are generally sold in markets and eaten for its high nutritional and medicinal values. Bioactive compounds of the fruits display a broad-spectrum of therapeutic properties. The present investigation is aimed to biosynthesize potent antimicrobial silvernanoparticles using ethanolic fruit extract – ZM (F)-ET. The synthesized nanoparticles (ZM (F)-ET AgNPs) were confirmed by color transformation and Ultra violet-Visible Spectrophotometer. The size and morphology of the silver nanoparticles were characterized by SEM and particle size analyzer. The stability of silver nanoparticles was detected by FT-IR and PXRD. The appearance of reddish brown color and UV absorption at 477 nm (0.5 OD) confirmed the synthesis of silver nanoparticles. They are of spherical and their size is ranged from 18-70 nm under SEM observations. FT-IR spectra of silver nanoparticles showed absorptions for the functional groups C=O, -C=C, C-H, which indicated stability of the synthesized silver nanoparticles. Antibacterial activity of the ethanolic fruit (ZM (F)-ET) extract and its silver nanoparticles were tested against various human pathogenic gram-positive and gram-negative strains. Both of them showed potent antibacterial activity ranging from 11-19 mm.

KEYWORDS:*Ziziphus mauritiana,* silver nanoparticles, antibacterial, SEM.

Design and Synthesis of biogenic silver nanoparticles of Methanolic extract of *Latana camara L.*, and its anti bacterial potential

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Latana camara L., is a novel medicinal plant, enriched with potential bioactive molecules and exhibits broad-spectrum pharmacological activity. Therefore, the study was planned to biosynthesis antibacterial potent silver nanoparticles using methanolic leaf extract of *Latana camara* (LC AgNps). The synthesized nanoparticles were confirmed by color transformation and ultra violet-visible spectrometry. Antibacterial activity of synthesized silver nanoparticles and extracts tested against *Escherisia coli*, *staphylococcus aures* by well diffusion and Disc diffusion method in Nutrient agar medium. Formation of AgNps indicated by colour change from colourless to reddish brown color and Surface Plasmon Resonance of LC AgNPs indicated by UV absorption at 435 nm (OD 0.635) confirm the synthesis of silver nanoparticles. The LC AgNps and extracts showed significant antibacterial activity against tested microorganism and their compared by ciproflaxin. Silver nanoparticles prepared from the leaves of *Latana camara* would be helpful for the preparation of potent to anti bacterial agent combact against human pathogenic bacteria.

Preparation and characterization of a novel Ag/carrageenan–gelatin hydrogel hybrid nanocomposite for antibacterial applications

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Red algae or Rhodophyta are one of the oldest groups of eukaryotic algae. Red algae are red due to the presence of phycoerythrin. They are used for treating certain medical conditions due to their rich content of vitamins, minerals and antioxidants that are easily utilized by our body. Red algae contain carrageenan polymer having repeated linear sulphated 3,6-anhydrogalactose polysaccharides joined by α-1,3 and β-1,4 glycosidic linkage. Carrageenans are extracted from red edible sea weeds. The present study is concerned with the preparation of a novel hydrogel hybrid nanocomposite from carrageenan–gelatin and Ag nanoparticles. The biodegradable hydrogels are mostly used in tissue engineering especially in wound healing. In our studies, we collected red algae from Mandapam area in Ramanathapuram district. The polymer based silver nanoparticles were prepared from collected sea weeds and characterized by various techniques. The carrageenan polymers are used both as reducing and capping agent for the preparation of Ag nanoparticles. Glutaraldehyde is used as a cross linking agent for the preparation of bio hybrid hydrogel. The carrageenan polymer capped Ag nanoparticles shows a broad absorption at 400-500 nm range. The FTIR and XRD characterization studies reveal the presence of sulphated and glycosidic linkages. The SEM and EDX characterization reveal sample surface morphology and its composition. SEM images on bacterial cells have been taken to check the effect of Ag nanoparticles on the surface of bacterial cell. TEM studies reveal its internal composition. The antibacterial activity of bio hydrogel hybrid nanocomposite has been tested with *E.coli* and human pathogenic bacteria *S. agalactiae* and *S. pyogenes.*

Study of Antidiabetic & Hypolipidemic activity of *Crateva magna* root in comparison with *Eugenia jambolana* seed

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Diabetes mellitus is a group of metabolic disorders characterized by hyperglycemia due to insulin deficiency. Diabetes mellitus is set to become one of the worlds biggest health problems owing to the projected increase in new cases. In complications are the major cause of morbidity and mortality in Diabetes mellitus. So many herbal drugs are used in the treatment of Diabetes mellitus. *Crateva magna* is found to have anti diabetic activity. As per the literature review still date no anti diabetic activity has been reported on this plant. In review of literature, *Crateva nurvella* has shown antidiabetic activity. *Crateva magna* also has come from the same family, Hence, this study has been taken to explore its the antidiabetic and hypolipidemic potential of *Crateva magna root* on streptozotocin induced Diabetes in *Wistar albino* rats and compared with Eugenia jambolana seed which is well known for its anti diabetic activity. The Hydroalcoholic extract of root of *Crateva magna* in a dose of 300mg/kg;p.o showed statistically significant antidiabetic and hypolipidemic activity. The Hydroalcoholic extract of seed of *Eugenia jambolana* in a dose of 300mg/kg; p.o showed statistically significant antidiabetic and hypolipidemic activity. The extract showed significant activity against Streptozotocin induced Diabetes in rats when compared with that of standard drug Glibenclamide. We understand as per the literature survey *Crateva magna* reduces the blood sugar level by inhibiting by enzyme alpha glucosidase therefore Eugenia jambolana potentiates the antidiabetic effect of *Crateva magna*. The extract showed significant activity against Streptozotocin induced Diabetes in rats when compared with that of standard drug Glibenclamide. To conclude, the results of the present study reveal the antidiabetic and hypolipidemic activity against diabetes in rats. Further investigation is underway to determine the exact phyto constituents in the extract that are responsible for its antidiabetic and hypolipidemic activity. We recommend who so ever wants to continue this work to try upon other antidiabetic herbal drugs and its mixture with *Crateva magna* and in this way to introduce into the market newer and safer poly herbal anti diabetic formulation. Then only these findings will act as a boon for the humanity suffering from diabetics.

Green Synthesis, Preparation,Characterization and *In-vitro* Antiinflammatory Activity of Silvernanoparticles from *Psychotria Octosulcata W.A.Talbot*

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Nanotechnology has emerged as an exciting approach in the drug development process and amoung the various metal nanoparticles, Silver nanoparticles have been explored for its variety of medicinal Applications.Green Synthesis of silver nanoparticles is an eco friendly and cost effective method for the development of silver nanoparticles.In this present investigation the green synthesis of silver nanoparticles by using the whole plant extract of medicinally valuable plant *Psychotria Octosulcata W.A.Talbot* was carried out.The green synthesized silver nanoparticles were characterized by using UV Spectroscopy, Scanning electron microscope(SEM) and FT-IR. UV spectroscopy reveals the maximum absorption at 440nm The SEM confirm the synthesis of spherical shape of nanocrystalline particles.FT-IR revels that the carboxyl and amine groups may be involved in the reduction of silver ions to silver nanoparticles..The *invitro* Antiinflammatory activity was studied by Protein Denaturation method.It can be concluded that the whole plant of *Psychotria Octosulcata W.A.Talbot* can be a good source for the synthesis of silver nanoparticles and could be successfully used as a therapeutic agent for the treatment of Inflammation.

Key Words: Nanotechnology, Silver nanoparticles, Antiinflammatory Activity.

Applying Soft computing techniques for drug discovery process

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Due to the recent advancement in computational techniques, Drug discovery process can be simplified by the application of soft computing techniques in target identification, lead identification, target validation, lead optimization stages of drug discovery process to overcome the limitation of traditional methods. Artificial Neural Network (ANN) can be applied for predicting the protein-protein interaction. The main objective of this study is to computationally predict the dengue-human protein interaction that assists to know which human proteins are affected when DENV enters the human body. This study focuses on applying ANN for predicting dengue human protein interaction. The results show the effectiveness of the features and algorithm in predicting the interaction type which leads to the development of anti-viral drugs.As an outcome of this study, the trained network model classifies the various type of interaction between dengue protein and human protein. This study also explores the most affected human protein by dengue virus. Moreover, it is evidently proved that NS3, NS5 acts as a validated therapeutic target for developing antiviral drugs against dengue. The finding will be useful in understanding the effectiveness of machine learning algorithm in computational drug discovery. Hence, it can is concluded that ANN technique can contribute better to drug discovery.

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An Overview of Nipah virus and the importance of computational drug discovery

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Abstract

The Viral infection has become a global threat to human health. The Latest newcomer of the paramyxoviridae family, The Nipahvirus is an emerging Zoonotic virus which causes a range of illnesses from asymptomatic infection to acute respiratory illness and fatal encephalitis. Fruit bats of the Pteropodidae family are the natural host of Nipah virus. It can be transmitted to humans from animals (bats, pigs), and can also be transmitted directly from human-to-human.There is no treatment or vaccine available for either people or animals. Hence, The World Health Organization (WHO) reported Nipah virus as a public health emergency due to its widespread. The molecular mechanisms of how the virus is passed from species to species are still unknown. The genomic and proteomic structure of this virus is unclear. There is a need for innovative research methodology to ease the development of therapeutic agents to control the virus. Here we present the overview of Nipah virus and highlights the importance of computational drug discovery in the development of antiviral drugs against Nipahvirus .

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Formulation and characterization of Ibuprofen Sustained release tablets by Solid Dispersion Technique

S. Manju, C. Rubina Reichal

Abstract

The purpose of the investigation was to prepare sustained release tablets of Ibuprofen by solid dispersion technique. The solubility of poorly soluble drug was enhanced by preparing solid dispersion of the drug with β-Cyclodextrin in various concentrations. The optimized solid dispersions were kneaded with suitable proportions of Rate controlling polymer such as HPMC K4M and HPMCK 100 M. The sustained release tablets were prepared by wet granulation method. The pre-compressive parameters for blends and post compressive parameters for tablets were evaluated. All formulations were showed desired pre and post compressed characteristics. The *Invitro* release studies of prepared were compared with that of innovator. The optimized formulation was fitted with various kinetic models and results revealed that the diffusion release mechanism. Stability study was conducted as per ICH guidelines and the results showed that there is no physical or chemical change. It is concluded that an effective, rugged formulation technology is feasible with the advantages of sustained release action with minimum amount of dose for Rheumatoid arthritis.

Formulation and *Invitro* evaluation of Topical Niosomal Gel of Ibuprofen

Mohammed Nawaz, Rheshma, Arumugam, Arivazhagan, C. Rubina Reichal

Abstract

The core objective of the present study is to develop Sustained release formulation of ibuprofen by topical niosomal drug delivery for Rheumatoid arthritis, in order to minimize gastrointestinal disturbances and provide better therapeutic effect. Ibuprofen niosomes were prepared by thin flim hydration method using 1:1:1 ratio of drug: cholesterol: and surfactant. The formulations were optimized with respect to vesicle, shape, entrapment efficiency, Compatibility studies and *in vitro* drug release. FTIR spectra showed that the drug and excipients were compatible. The *invitro* release indicates that all formulations exhibited retarded release for 24 hrs. The best formulation was selected and to develop as Gel for topical use using Carbopol and HPMC. Stability studies were conducted as per ICH guidelines. The niosomal drug delivery may reduce the frequency of dosing intervals and improve the patient compliance.

FORMULATION AND EVALUATION OF FAST DISSOLVING ORAL FILM OF SITAGLIPTIN PHOSPHATE BY SOLVENT CASTING METHOD

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ABSTRACT

Present work aimed at preparing fast dissolving film of sitagliptin phosphate by using solvent casting method. Sitagliptin phosphate is a Di-peptidyl peptidase-4 inhibitor, which is used in the treatment of type II diabetes mellitus. Fast dissolving oral films are useful in patients such as pediatric, geriatric, bedridden, who face difficulty in swallowing conventional tablets or capsules and liquid orals. The films were prepared by using polymers such as HPMC E15 and HPMC E50, plasticizer such as PEG and citric acid used as saliva stimulating agent. They were evaluated for physical characteristics such as thickness, uniformity of weight, folding endurance, drug content, surface pH, percentage elongation and tensile strength and give satisfactory results. The formulations were subjected to disintegration. The in-vitro disintegration time of the optimized batch F4 was found to be 20 sec.

KEYWORDS:

Sitagliptin phosphate, Diabetes mellitus, Fast dissolving film, HPMC, PEG, Solvent casting method.

FORMULATION AND EVALUATION OF FLOATING MICROSPHERE OF AMLODIPINE BESYLATE

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Abstract:

The need of this research work was to formulate a novel gastro retentive floating microsphere of Amlodipine Besylate. An amlodipine Besylate has maximum solubility in acidic pH and thus most suitable to proglonged release of drug in stomach . It is used as antihypertensive, angioselective calcium channel blocker and inhibits the movement of calcium ions into vascular smooth muscle cells and cardiac muscle cells which inhibits the concentration of cardiac muscle and vascular muscle cells. Floating microsphere of amlodipine besylate were formulated by using various materials such as Hydroxy propyl methyl cellulose, Ethylcellulose, Polyvinyl pyrrolidine, Eudragit RS 100, Ethanol, Dichloromethane, sodium lauryl sulphate. The concentration of these agents was also optimized to get desired controlled release of drug. The floating microsphere was prepared by using solvent evaporation technique. The formulated floating microsphere were evaluated for physical characterization, Bulk density, Tapped density, Angle of repose,carr's index, Hausner's Ratio, Size of microsphere, Entrapment efficiency and Swelling index, Buoyancy studies, invitro dissolution studies and stability studies were performed over 0 ,1,2 months.

Keywords:

Floating microsphere, Amlodipine besylate, HPMC, PVP, Antihypertensive, Solvent evaporation method, Gastro retentive, controlled release.

FORMULATION AND EVALUATION OF ANTI-ACNE GEL CONTAINING HERBAL DRUGS

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ABSTRACT

In the present study an attempt was made to formulate gel containing aloe vera and rose water. The result showed that the optimal formula of anti-acne with rose water. Aloe vera gel and rose water containing rose water 0.5%, aloe vera gel 10%, rose water 10%, carbopol-940 1.75%, HPMC 1.75%, sodium benzoate q.s to neutral pH and water q.s to 100 ml. It was non irritant to skin. In vitro non bacterial activity was performed against propionibacterium acnes MTCC3297. A causative organism for acne vulgar for the developed formulation using agar well diffusion method. The measured zones of inhibition of the formulation were compared with standard antibiotic clindamycin, standard marketed topical preparation for acne.

KEYWORDS

- ALOE VERA GEL
- HPMC
- CARBAPOL-940
- DIFFUSION METHOD

"FORMULATION AND DEVELOPMENT OF HERBAL GEL CONTAINING *Senna auriculata* FOR THE TREATMENT OF DIABETIC FOOT ULCER"

Stanely baskar*, Swetha, Anaxa jose, Rajkumar.C, sumithiri, subhashini.

The present study, aimed to formulation development of herbal gel containing *senna auriculata* fresh flower and leaf aqueous extract for the treatment of diabetic foot ulcer. The gel formulated was designed by using aqueous extract of leaves of *senna auriculata* as well as flowers of S.auriculata .Which the topical gel was evaluated by various physical tests, antimicrobial activity test and microbial limit test. The gel was prepared by using carbapol 940(1%w/v),*Senna auriculata* extract in various concentration, acetone, propylene glycol 400, methyl paraban, propyl paraban, EDTA, tri-ethanolamine and required amount of water. The prepared gels were evaluated for physical appearance, Consistency, Homogeneity, Skin irritation test, pH test, Extrudability, Spreadability, Viscosity(Brookfield viscometer), Drug content, Antimicrobial activity test(agar well diffusion method) and Microbial limit test. The gels showed significant inhibition against microbial growth in antimicrobial activity. Further pharmacological studies will be carried out for future drug development.

Key words: *senna auriculata*, gel formulation, *Invitro* antimicrobial activity agar well diffusion method, Diabetic wound healing activity.

FORMULATION AND EVALUATION OF FLOATING MICROSPHERE OF AMLODIPINE BESYLATE

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Abstract:

The need of this research work was to formulate a novel gastro retentive floating microsphere of Amlodipine Besylate. An amlodipine Besylate has maximum solubility in acidic pH and thus most suitable to proglonged release of drug in stomach . It is used as antihypertensive, angioselective calcium channel blocker and inhibits the movement of calcium ions into vascular smooth muscle cells and cardiac muscle cells which inhibits the concentration of cardiac muscle and vascular muscle cells. Floating microsphere of amlodipine besylate were formulated by using various materials such as Hydroxy propyl methyl cellulose, Ethylcellulose, Polyvinyl pyrrolidine, Eudragit RS 100, Ethanol, Dichloromethane, sodium lauryl sulphate. The concentration of these agents was also optimized to get desired controlled release of drug. The floating microsphere was prepared by using solvent evaporation technique. The formulated floating microsphere were evaluated for pre formulation studies like solubility, FTIR, physical characterization, Bulk density, Tapped density, Angle of repose,carr's index, Hausner's Ratio,.Morphological character like SEM, Size of microsphere, Entrapment efficiency and Swelling index, Buoyancy studies, invitro dissolution studies and stability studies were performed over 0 ,1,2 months.

Keywords:

Floating microsphere, Amlodipine besylate, HPMC, PVP, Antihypertensive, Solvent evaporation method, Gastro retentive,SEM , controlled release.

ANTIBIOTIC RESISTANCE FROM OVER THE COUNT, DIET, PRESCRIPTION AND MISSUSE OF THE ANTIBIOTICS

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METHODS:

- **By collecting OTC Drugs in several pharmacies**
- **By collecting prescriptions in several Pharmacies and Hospitals**
- **By using agar plate method with the help of E.coli**
- **By using agar slant method with the help of E.coli**

BY COLLECTING OTC DRUGS IN SEVERAL PHARMACIES

A survey on the use of antibiotics purchased through retail pharmacies was conducted in the cities of Tamil Nadu and Kerala. The survey found that purchasers visit a pharmacy when they are those who felt they needed antibiotics had minor symptoms such as ,Fever and Cold (34.1%) ,Throat pain(32.5%), Stomach pain(10.5%)and diarrhea(8.8%). The most often purchase were, Ampicillin(31.1%), Amoxycilline (42.5%) Cotrimoxazole (11.6%), Azithromycine (33.4%), cephalexin (21.2%) and ciprofloxacin (10%). The median of the purchased quantity was 10 tablets, the mean 11.34 tablets (95% cl, 9.65-12.97). About 30% of the purchasers intended to take antibiotics for 3 days or less. The main reason for not taking a full course of antibiotics was not economic constraint, but the purchasers having poor knowledge about antibiotics. Logistic regression analysis indicate the age of purchasers, length of symptoms and kinds of treatment used before visiting a pharmacy could be used as predictive variable for the decision to buy antibiotics in preference to alternative drugs.Antibiotics are also purchased by young rather than old peoples. The study documents need for the better health education about the rational use of antibiotics in the general public.

INVITRO ANTICANCER ACTIVITY OF THE AQUEOUS EXTRACTS OF THE LEAF AND STEM OF *Artemisia annua*

S.vijayalakshmi*,Abdalla salih,R.Aravindhan,Mohamed Rafi.V

R.Priyadarshini and R.Ramya.

ABSTRACT

Artemisia annua belonging to the family **Asteraceae** was selected to screen the *invitro* anticancer studies. *Artemisia Annua* species is a common type of wormwood native to temperate Asia, and scattered parts of North America. The plant also present in many countries. *Artemisia annua* L.(Asteraceae) is listed in the Chinese pharmacopoeia for the treatment of malaria and related symptoms (fever,chills).The Aerial parts of the plant contained 0.63-0.70% *artemisinin* per dry weight. Its active ingredient, Artemisinin (ARS) has been developed as antimalarial drug and is used worldwide. Interestingly, the bioactivity is not restricted to malaria treatment. Artemisinin (ARS) type of drugs also reveal anticancer activity of *invitro* and *invivo* studies. In our present *invitro* study with EAC cells we found mild anticancer activity. Aqueous extract of the leaf showed 15% at the concentration of 200µg and the stem extract showed 26% at the concentration of 200µg. *Invitro* study with DLA cells also showed mild anticancer activity. Aqueous extract of the leaf showed 18% at the concentration of 200µg and the stem extract showed 28% at the concentration of 200µg.

KEYWORDS: *Invitro* anticancer activity, *Artemisia annua*.

INVITRO ANTICANCER ACTIVITY OF THE AQUEOUS EXTRACTSOF THE LEAF AND STEM OF *VITEX NEGUNDO* Linn

DANIEL CEPHAS*, K.RAJASEKAR, J.GNANAKIRUBA, THIEU NAM LONG, K.M.MONISHA AND L.DHANDAPANI

Vitex negundo belongs to the family **Lamiaceae** grows as small tree with thin grey bark. The plant is widely distributed and also has pharmacological actions against wide spectrum of disease in traditional system of medicines.. Because of the richness in phytochemicals, the plant is attributed to possess a number of therapeutic uses, antimicrobial, anti-inflammatory, astringent, bronchodilator, CNS-depressant, detoxicant, diuretic, emmenagogue, anticancer and hepatoprotective etc.,In our present *invitro* study with EAC cells we found mild anticancer activity. Aqueous extract of the leaf showed 10% at the concentration of 200µg and the stem extract showed 29% at the concentration of 200µg. *Invitro* study with DLA cells also showed mild anticancer activity. Aqueous extract of the leaf showed 15% at the concentration of 200µg and the stem extract showed 32% at the concentration of 200µg.

KEYWORDS: Invitro anticancer acitivity, Vitex negundo.

FORMULATION AND EVALUATION OF HERBAL GEL CONTAINING THESPESIA POPULNEA FOR TREATMENT OF PSORIASIS

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UNDER THE GUIDENCE OF

Mr.J.KARTHIKEYAN, M.Pharm

Professor

Department of pharmaceutics

Herbal medicines based on the plant *Thespesia populnea* (Malvacea) used in the medicine of different cultures of india and some parts of world. This plant is used in the treatment of cutaneous affections such as scabies, psoriasis, ringworm, guineaworm, eczema and hepatic diseases. However, there are no established scientific reports for its anti-psoriatic activity. Phytochemical investigation revealed the presence of carbohydrates, glycosides, tannins, flavonoids, triterpenoids, phytosterols, proteins and lipids/fixed oils in the bark of *Thespesia populnea*. Screening for anti-psoriasis activity was carried out by topical application of different extracts & isolated compounds. Psoriasis is a common chronic inflammatory dermatitis. It most frequently affected by bacteria(staphylococcus aureus) and fungi(candida albicans). Formulation of herbal gel is carried out by hydro gel method. Successive pet-ether extract showed maximum anti-psoriatic activity. The preformulation studies of herbal gel characterised by organoleptic characteristics, solubility and drug excipient compatibility study. The herbal gel can be evaluated by using its consistency, appearance, pH, skin irritation test, drug content, viscosity, anti microbial activity test and accelerated stability studies. The plant *Thespesia populanea* is promising for further investigations to prove its anti-psoriatic activity.

KEY WORDS : *Thespesia populnea*, anti-psoriatic activity, Evaluation parameters.