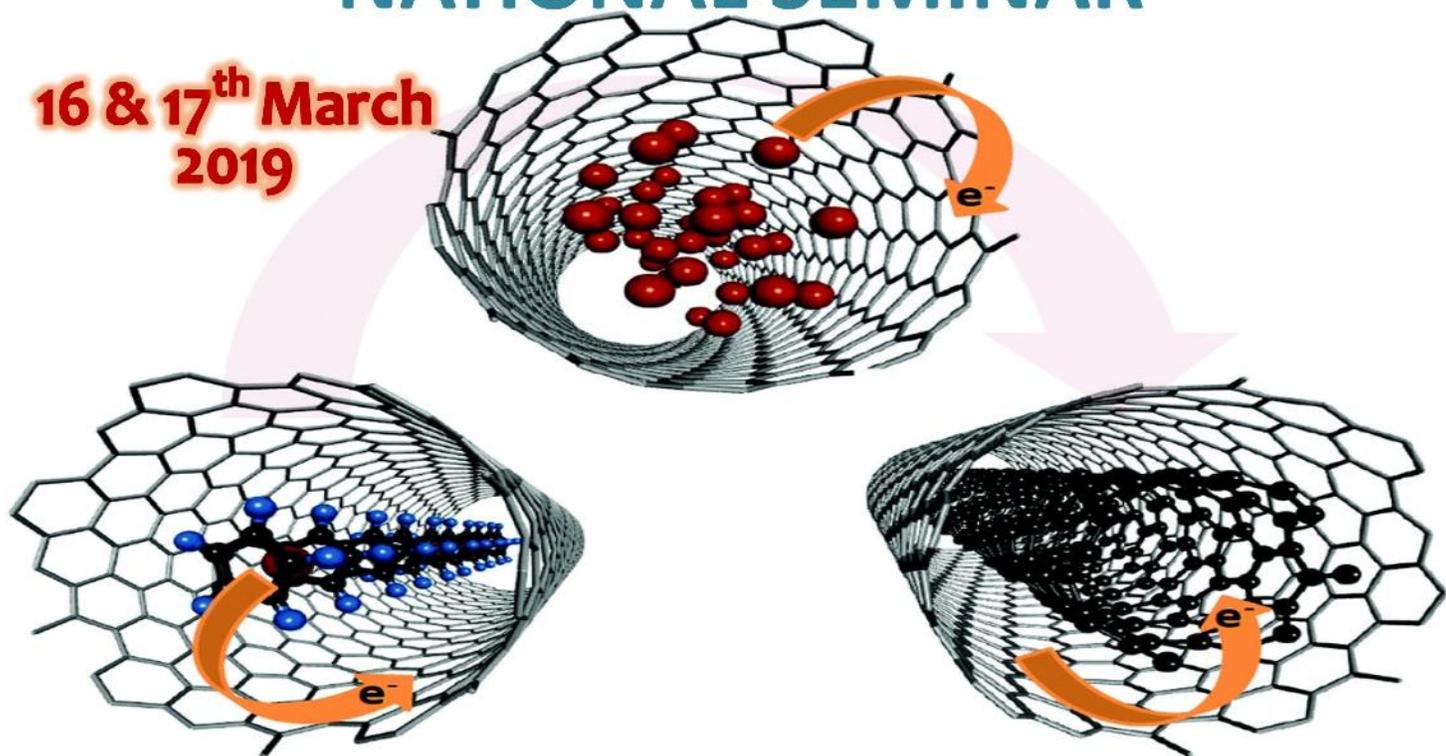


SOUVENIR

MPCOST SPONSORED NATIONAL SEMINAR

16 & 17th March
2019



**EMERGING TRENDS
AND INNOVATIONS
IN PHARMACEUTICAL
NANOTECHNOLOGY &
NANOMEDICINE**

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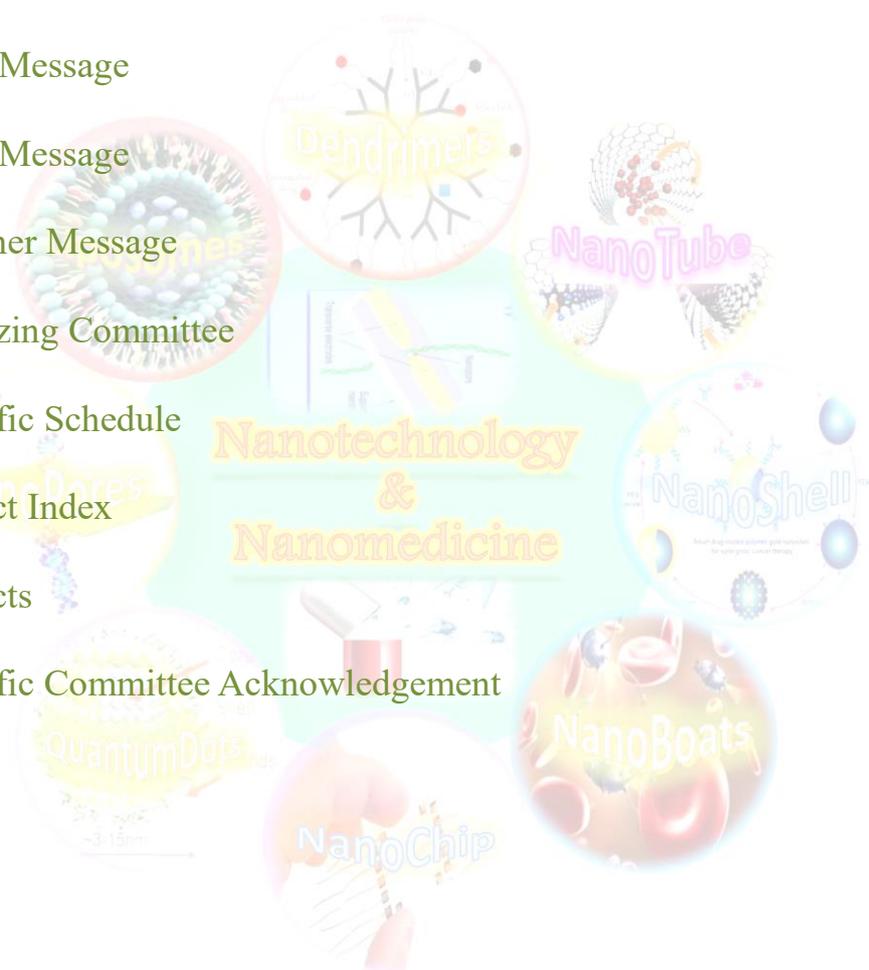
ORGANISED BY

CHAMELI DEVI INSTITUTE OF PHARMACY,

Village Umrikheda, Khandwa Road, Indore,
Madhya Pradesh. Pin: 452 020

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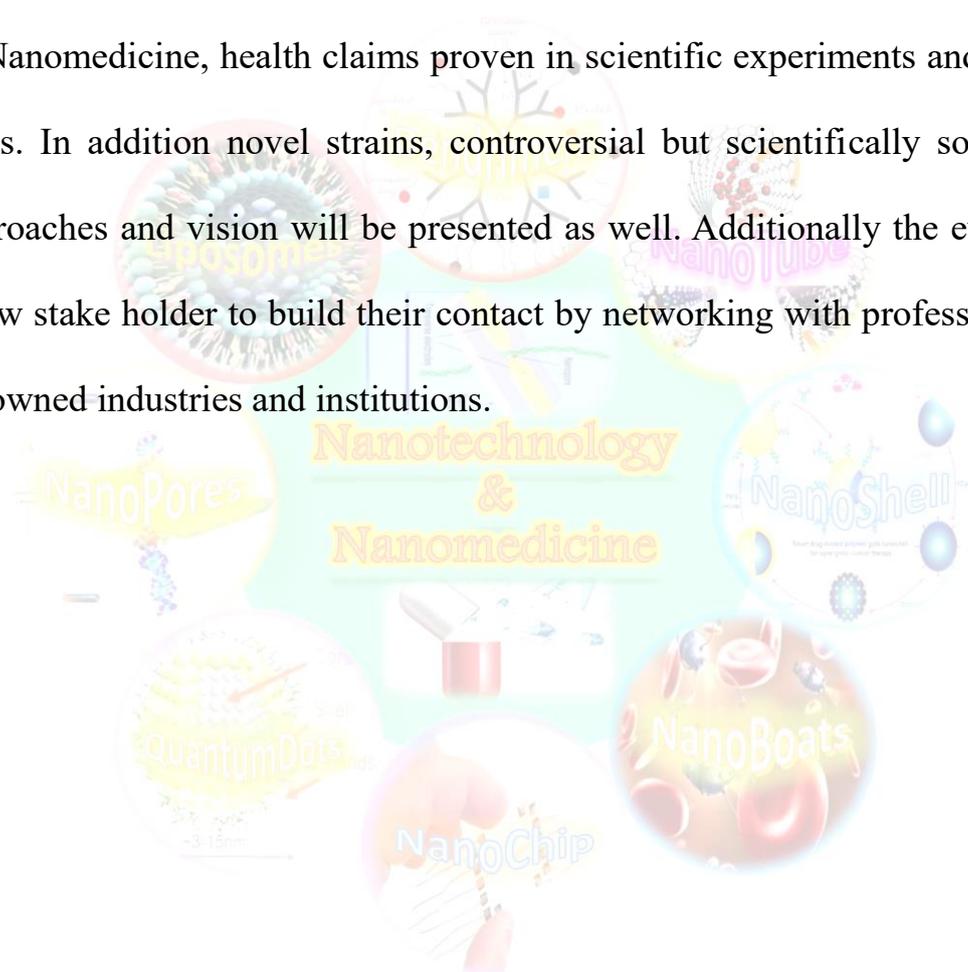
ABOUT INSTITUTE



Chameli Devi Institute of Pharmacy is playing a significant role in the holistic development of young professional in addition to bridging the gap between the levels of quality education. The institute has a greater responsibility of making the student fraternity to be competent at national and international levels.

ABOUT SEMINAR

This seminar will provide scientific forum for all stake holders of pharmaceutical sciences and technology to enable the interactive exchange of state of the art knowledge. The seminar will focus on evidence based benefits of Nanomedicine, health claims proven in scientific experiments and clinical trials. In addition novel strains, controversial but scientifically solid ideas approaches and vision will be presented as well. Additionally the event will allow stake holder to build their contact by networking with professionals of renowned industries and institutions.





Chief Patron

MPCOST National Seminar, 2019

Message

It gives me immense pleasure and satisfaction that Chameli Devi Institute of Pharmacy is organizing an MPCOST sponsored two day National Seminar on “Emerging Trends and Innovations in Pharmaceutical Nanotechnology & Nanomedicines” on 16- 17th March 2019.

I hope that the event will provide a highly stimulating and interactive platform for all the delegates, to explore and exchange the latest ideas and advancements in health care system. Seminar is composed of lectures by distinguished speakers, plenary talk, keynote addresses and technical papers and presentations to address various challenges and innovations in the field of Pharmaceutical Science and Nano Medicine.

I am really delighted to send my best wishes to the organizers and participants of National Seminar and wish all the success for the seminar.

Vinod Kumar Agarwal

Chairman

CDGI, Indore



Patron

MPCOST National Seminar, 2019

Message

I am very glad to know that Chameli Devi Institute of Pharmacy is organizing MPCOST sponsored two day National Seminar on “Emerging Trends and Innovations in Pharmaceutical Nanotechnology & Nanomedicines” on 16- 17th March 2019, and releasing a souvenir to mark the event. Chameli Devi Institute of Pharmacy is one of the most vibrant departments and has been actively contributing to the needs and demands of the society at large in fostering academic research and developments.

Seminar is meant essentially for scientific exchange and generation new ideas in the chosen field along with personal interaction. I hope that this seminar will disseminate innovative ideas in new and emerging technologies in nano-medicines.

I congratulate the organizers for their initiative and attracting a wide range of papers from experts in their fields. I wish all the speakers and delegates a most informative and enjoyable seminar.

I extend my best wishes for the success of seminar and release of souvenir.

Sanjay Kumar Agarwal
Vice-Chairman
CDGI, Indore



Patron

MPCOST National Seminar, 2019

Message

I have immense pleasure in writing this message on the occasion of the National Seminar on “Emerging Trends and Innovations in Pharmaceutical Nanotechnology & Nanomedicines” hosted by the Chameli Devi Institute of Pharmacy, Indore on 16- 17th March 2019. This seminar will provide a platform to groom young scientists from all over the country and to bridge the researchers working in academia and other professionals through current technological trends. It is a high time to create research activities among the budding professionals. May this Conference provide greater opportunities for every member of this specialty to learn more and let this learning be of immense help to the community at large. I congratulate the organizers for their initiative and wish the Conference all success.

Dr. Joy Banerjee
Group Director
CDGI, Indore



Organizing Chairman
MPCOST National Seminar, 2019

"Learning gives creativity, creativity leads to thinking, thinking leads to knowledge and knowledge makes you competent."

Warm Greeting to All!!!!

It gives me an immense pleasure that Chameli Devi Institute of Pharmacy is organizing the National Seminar with the theme of "Emerging Trends and Innovations in Pharmaceutical Nanotechnology & Nanomedicines" on 16- 17th March 2019. The conference is aimed to provide the platform for industrialists, educationists, researchers and students to debate and discuss on the vital need of research. The unique event will explore the significance of nuclear medicine and scanning. The seminar with your support is putting its best efforts to conduct this mega event in a befitting manner, considering the importance of nanotechnology and nanomedicines in human health. The theme of the seminar seeks to not only strengthen our commitment towards the ideals of our specialty, but also to encourage us to look ahead and stay abreast of the latest developments in nanotechnology with special reference to medicine and academic research. The entire seminar will be addressed by eminent scientists and professors as key note/invited speaker while it will also attract young researchers, faculties and students across the country, who will take part as poster presentations. I extend my warm welcome to the resource persons young researchers, budding Pharma professionals, eminent scientists, guests, faculties, and industrialists in this splendid conference and wish the conference a great success. I hope all the delegates will derive maximum benefit from this event and take back fond memories of the Indore experience!

Best wishes...

Jai Hind

Dr. Arun Kumar Gupta
Principal
CDIP, Indore

CHIEF PATRON

Shri Vinod Kumar Agarwal
Chairman, CDGI, Indore

PATRON

Shri Sanjay Kumar Agarwal
Vice Chairman, CDGI, Indore
Dr. Joy Banerjee
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SAGAR



DR. UMESH GUPTA
CURAJ
AJMER



NATIONAL SEMINAR

PROGRAMME SCHEDULE

Day-01

TIME	ACTIVITY	VENUE
09:30 am -10:30 am	Registration, Kit distribution & Breakfast	Auditorium
10:30 am -12:00 pm	Inaugural Function	Auditorium
PLENARY LECTURE-I		
12:00 am - 01:00 pm	Prof. N. K. Jain	
01:00-02:00 pm LUNCH		
PLENARY LECTURE- II		
02:00 pm – 03:00 pm	Prof. S. K. Jain	
03:00 pm – 04:00 pm	Open Discussion & Oral Presentations	
04:00-04:15 pm HIGH TEA		

Day-02

TIME	ACTIVITY	VENUE
10:00 am -10:30 am	Breakfast	Auditorium
PLENARY LECTURE- III		
10:30 am -11:30 am	Dr. Umesh Gupta	
11.30 am - 01:00 pm	Open Discussion, Oral & e-poster Presentations	
01:00-02:00 pm LUNCH		
02:00pm – 02:30 pm	Award ceremony and Valedictory Function	

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CDIP/ MPCOST/03	Development and Characterization of TPGS Based Targeted Liposomes for Efficient Delivery of Chemotherapeutics to Breast Cancer	Balak Das Kurmi	bdkurmi@gmail.com
CDIP/ MPCOST/04	Diverse Application of Arthrospira Potential Herb	Dr. Gyanendra Singh	gyanendrasingh75@gmail.com
CDIP/ MPCOST/05	Formulation and Evaluation Fast Dissolving Tablets of Lovastatin using Solid Dispersion Method	Manohar Chouhan	manohar41mt6383@gmail.com
CDIP/ MPCOST/06	Fabrication and Evaluation of Mesalamine Multiparticulate for Colon Targeted Drug Delivery System	Meenakshi Jaiswal	meenakshi_123123@rediffmail.com
CDIP/ MPCOST/07	Silica Nanoparticles and their Potential Applications	Niharika Borral	laxmibhumarkar@gmail.com
CDIP/ MPCOST/08	Formulation, Development and Evaluation of Multiparticulate System (Microsphere) For Management of Colon Cancer	Sandeep Kumar Sonkar	ssonkar12@gmail.com
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SILVER NANO PARTICLES

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ABSTRACT

Nanotechnology is an emerging and fast-growing technology. Silver nanoparticles are nanoparticles of silver of between 1 nm and 100 nm in size. Silver nanoparticles account for more than 23% of all nano-products. Out of all kinds of nanoparticles; silver nanoparticles seem to have attracted the most interests in terms of their potential application. Silver has been in use since time immemorial in the form of metallic silver, silver nitrate, silver sulfadiazine for the treatment of burns, wounds and several bacterial infections. Nanotechnology is gaining tremendous impetus in the present century due to its capability of modulating metals into their nano size, which drastically changes the chemical, physical and optical properties of metals. Silver nanoparticles have emerged up with diverse medical applications ranging from silver based dressings, silver coated medicinal devices, such as nanogels, nanolotions, etc.

Keywords: Silver; Nanotechnology; Silver nanoparticles.

**DEVELOPMENT AND IN VITRO STUDY OF HYDROGEL NANOPARTICLES
CARRIER AS NOVEL DRUG DELIVERY SYTEM**

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ABSTRACT

Hydrogel nanoparticles are used for colon drug delivery systems, by utilizing as a model drug. NPs were prepared by using Poly-acrylamide-grafted- gum ghatti (PAAm-g-Gg), which is pH sensitive. PAAm-g-Gg was synthesized by free radical polymerization. FT-IR and DSC studies of the prepared NPs indicated no chemical change of in the hydrogel NPs. The prepared hydrogel NPs showed mean diameters in the range of 237 ± 0.54 nm to 1058 ± 0.99 nm. The encapsulation efficiency of the drug was found to be 39.18% to 47.84%. The suitability of the polyacrylamide grafted gum ghatti hydrogel NPs for the release of Methotrexate was studied by in vitro release at pH 1.2 and 7.4. It was observed that, there was no significant amount of drug release in gastric pH and 97.28% of drug release at pH 7.4 for formulation F5 at the end of 12 hrs. Based on result formulation F5 was considered as the best formulation and further evaluated for stability studies and characterized for surface morphology using SEM. and the stability study data indicated no significant change in the drug content.

Key Words- Nanoparticles, Colon target drug delivery system, Hydrogel

DEVELOPMENT AND CHARACTERIZATION OF TPGS BASED TARGETED LIPOSOMES FOR EFFICIENT DELIVERY OF CHEMOTHERAPEUTICS TO BREAST CANCER

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ABSTRACT

The aim of present study to develop targeted liposomal system to enhance delivery of anticancer drug with reduced associated side effects. In recent times, a lot of advancement has occurred in the anticancer drug delivery via targeted nanocarriers to treat different carcinoma. In this regard D-a-tocopheryl polyethylene glycol 1000 succinate (TPGS) coated Dox containing targeted liposomal formulations were developed and for the effect of formulation variables a 3-factor, 3-level Box-Behnken design (BBD) was explored. Prepared TPGS based liposomal formulations were characterized for their different characteristics like morphologies, particle size and zeta potential. The entrapment efficiency, in vitro drug release, cytotoxicity and hemolytic toxicity, were also assessed to ascertain the favourable parameters for its therapeutic usefulness. Anticancer activity on MCF-7 and MCF-7/Adr cell line indicated the comparatively higher potency of Dox containing TPGS based liposome with plain liposome and drug solution due to p-gp inhibiting property of TPGS which might be reduced the efflux of drug molecule extracellularly by MDR cells. These findings support that TPGS based liposomes could be promising nanocarriers for the efficient delivery of chemotherapeutics.

Keywords: Liposome, TPGS, Chemotherapeutics, Breast cancer, MCF-7.

DIVERSE APPLICATION OF ARTHROSPIRA POTENTIAL HERB

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ABSTRACT

Spirulina is a photosynthetic, filamentous, spiral-shaped, multicellular and green-blue microalga. The two most important species of which are *Spirulina maxima* and *Spirulina platensis*. It is a microalga belonging to Chyanophyceae class. Its chemical composition includes proteins (55%-70%), carbohydrates (15%-25%), essential fatty acids (18%) vitamins, minerals and pigments like carotenes, chlorophyll a and phycocyanin. Used in food and cosmetic industries. Spirulina is considered as an excellent food, lacking toxicity and having corrective properties against viral attacks, anemia, tumor growth and malnutrition. It has been reported that the use of these microalgae as animal food supplement implies enhancement of the yellow coloration of skin and eggs yolk in poultry and flamingos, growth acceleration, sexual maturation and increase of fertility in cattle. Spirulina can play an important role in human and animal nutrition, environmental protection through wastewater recycling and energy conservation. Spirulina is rich in proteins (60-70%), vitamins and minerals used as protein supplement in diets of undernourished poor children in developing countries. One gram of Spirulina protein is equivalent to one kilogram of assorted vegetables. The mass cultivation of Spirulina is achieved both in fresh water and waste water. Spirulina grown in clean waters and under strictly controlled conditions could be used for human nutrition. The micro alga grown in waste water is used as animal feed and provide a source of the fine chemicals and fuels. The waste water system is highly applicable in populated countries like India where wastes are generated in high quantities and pose environmental problem. It has high levels of vitamins, minerals, phenolics, essential fatty acids, amino acids and pigments. Furthermore, the development of new protein sources to supply the shortage of this nutrient is an urgent need, and protein from *S. platensis* plays an important role . In this sense, extraction processes that allow maximum protein yield and total utilization of biomass is an urgent need, and ultrasonic waves have proven to be an effective extraction technique

Key Words: food, microalgae, nutrition, Spirulina, Flamingos etc

**FORMULATION AND EVALUATION FAST DISSOLVING TABLETS OF
LOVASTATIN USING SOLID DISPERSION METHOD**

Manohar Chouhan, Deepak Gupta, Dr Raju Choukse, Dr R.K Maheshwari

Dr AJP Abdul Kalam University, Indore (M.P) India.

SGSITS Indore (M.P), India

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ABSTRACT

The research worked based using solid dispersion method though poorly soluble drugs lovastatin and simvastatin by formulating it as solid dispersions subsequent preparation of fast dissolving tablets with the prepared solid dispersions using different concentrations of super disintegrates and comparing them with that of the marketed product. Lovastatin is a HMGCoA reductase inhibitor used in the treatment of hyperlipidemias and prevention of ischemic heart disease. It is practically insoluble in water, sparingly soluble in alcohol and soluble in acetone. In the present investigation lovastatin and simvastatin solid dispersion were prepared by physical mixing, fusion, solvent evaporation and lyophilization methods using polyethylene glycol-6000 as an inert amphiphilic carrier. The prepared solid dispersions were evaluated for pre compression parameters such as angle of repose, Carr's index, particle size and drug content.

Keywords: Solid Dispersion, Poorly Soluble Drugs, Super Disintegrates.

**FABRICATION AND EVALUATION OF MESALAMINE MULTIPARTICULATE
FOR COLON TARGETED DRUG DELIVERY SYSTEM**

*Meenakshi Jaiswal, Dr. S K Lanjhiyana

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ABSTRACT

Mesalamine (5-ASA) is an anti-inflammatory drug used in treatment of Crohn's disease and ulcerative-colitis. As Mesalamine is rapidly absorbed from the small intestine and it is necessary to develop a colon-specific delivery system for it. In the long-term management of ulcerative colitis patients, repeat dosing maybe required. Since Mesalamine (5-ASA) is largely absorbed from the upper intestine, selective delivery of drugs into the colon may be regarded as a better method of drug delivery with fewer side effects and a higher efficacy. An objective of the present investigation is to prepare and evaluate Mesalamine microspheres for colon targeting. These microspheres were prepared by emulsion solvent evaporation method using different ratios of Mesalamine, Hydroxy propyl methyl cellulose (HPMC) and Ethylcellulose (EC), stirring speed (1000rpm) and emulsifier concentration(0.5% W/V). Cellulose coated Mesalamine microspheres were evaluated for surface morphology, particle size analysis, percentage drug entrapment, percentage yield and in vitro drug release studies. Drug release studies carried out in acidic medium (0.1NHCl) for 2hr and in phosphate buffer pH 7.4 up to 12hrs. In acidic medium, the release rate was much slower; however, the drug was released quickly at phosphate buffer pH 7.4. Microspheres prepared by using drug: polymer ratio 1:2.5 stirring speed 1000 rpm, and 0.5% wt/vol concentration of tween 80 (emulsifier) were selected as an optimized formulation. It is concluded from the present investigation that Mesalamine microspheres are promising controlled release carriers for colon-targeted drug delivery.

Keywords: Mesalamine, hydroxy propyl methyl cellulose, ethyl cellulose, colon targeted drug delivery system.

SILICA NANOPARTICLES AND THEIR POTENTIAL APPLICATIONS

Niharika Boral, Nisha Sharma, Laxmi Bhumarkar

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ABSTRACT

One of the greatest challenges in the field of medicine is the effective and efficient drug delivery to the defected cells or tumor cells with minimal toxic side effects. Due to lacking properties like specification and solubility of drug molecule, patient requires high doses of the drug to attain the desired therapeutic effect for the disease treatment. To overcome this problem various drug carriers are available in the pharmaceutical field, which help in delivering the therapeutic drug/ gene to the target site. For this purpose, silica nanoparticles are found to be biocompatible, chemically and thermally stable nanoparticles. Silica nanoparticle have the broadest range of accessible sizes and can be synthesized as uniform particles from 5 to 2000 nm. Employing silica nanoparticles can be an advantageous approach for efficient drug delivery systems. Silica nanoparticles can be functionalized for the purpose of drug carrying. Silica nanoparticles possess unique advantages as a delivery carrier, including excellent biocompatibility, high hydrophobicity, systemic stability, and resistance to pH changes, and also, large multifunctionality. Silica nanoparticles are being considered for several biomedical applications such as biomedical imaging contrast agents, ablative therapy sensitizers, and drug delivery vehicles.

Keywords: Silica, Nanoparticles.

**FORMULATION, DEVELOPMENT AND EVALUATION OF
MULTIPARTICULATE SYSTEM (MICROSPHERE) FOR MANAGEMENT OF
COLON CANCER**

Sandeep Kumar Sonkar*, Sanjay Kumar Lanjhiyana.

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ABSTRACT

The purpose of this investigation was to prepare and evaluate the colon-specific multiparticulate system (microspheres) of 5-fluorouracil (5-FU) for the treatment of colon cancer. The purpose of this investigation was to prepare and evaluate the colon-specific microspheres of 5-fluorouracil for the treatment of colon cancer. Core microspheres of alginate were prepared by the modified emulsification method in liquid paraffin and by cross-linking with calcium chloride. The core microspheres were coated with Eudragit S-100 by the solvent evaporation technique to prevent drug release in the stomach and small intestine. The prepared microspheres were evaluated for mean particle size and particle size distribution, drug loading, encapsulation efficiency and in-vitro drug release. FT-IR spectroscopic analysis was performed to ascertain drug polymer interaction. Release was sustained for up to 24 hours in formulations with core microspheres to a Eudragit S-100 coat ratio of 1:7, and there were no changes in the size, shape, drug content, differential scanning calorimetry thermogram, and in vitro drug release after storage at 40 degrees C/75% relative humidity for 6 months. The surface morphology of the prepared microspheres was studied by SEM.

Keywords: 5-Fluorouracil (5-FU), colon cancer, Microspheres, Alginate, Multiparticulate system.

**FOLATE RECEPTOR TARGETED LIPOSOMAL DELIVERY OF
CHEMOTHERAPEUTICS AGAINST SOLID TUMORS**

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ABSTRACT

In recent times, a lot of advancement has occurred in the anticancer drug delivery via targeted nanocarriers to treat different carcinoma. Although some rational approaches are required to develop such types of system which can facilitates the drug transport to the cancer site in sufficient concentration. The present investigation reports the development of nanoengineered folate receptor targeted folic acid conjugated liposomes, to the site-specific delivery of quercetin (QUE) to solid tumors. Liposomal formulations containing QUE with TPGS coating and folate conjugating were developed and characterized for their different characteristics like morphologies, particle size and zeta potential. The entrapment efficiency, in vitro drug release, cytotoxicity and hemolytic toxicity, were assessed. Cytotoxicity was carried out by MTT assay on MCF-7 cells cell line. The in vivo Blood level studies observed with QUE ($18.4 \pm 1.3 \mu\text{g/ml}$ and $0.41 \pm 0.11 \mu\text{g/ml}$), QUE -TPGS-LIPO ($13.5 \pm 0.9 \mu\text{g/ml}$ $3.3 \pm 0.66 \mu\text{g/ml}$) and QUE-TPGS-LIPO-FOL ($15.2 \pm 1.2 \mu\text{g/ml}$ and $5.3 \pm 0.72 \mu\text{g/ml}$) after 1 and 24 hrs respectively. Organ distribution assessment on tumor (MCF-7) bearing rat of different formulations both qualitative and quantitative displayed significant higher accumulation of drug in cancerous cells by QUE -TPGS-LIPO-FOL as compared with QUE -TPGS-LIPO and QUE followed by intravenous administration. The findings support that folate targeted TPGS Based Liposomes could be one of the promising nanocarriers for the targeted intracellular delivery of anticancer agents.

Keywords: Quercetin, Liposome, Folate, Solid Tumors, Targeting.

**IN-VITRO CHARACTERIZATIONS OF IONIC GELATION BASED
MICROPARTICLES FOR TARGETING TO COLON REGION**

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ABSTRACT

The objective of present study was for development and characterizations of stable, biodegradable chitosan-pectin based ionic cross-linked microparticles of diclofenac sodium for treatment of colonic bowel syndrome. The chitosan-pectin based formulations were prepared using Ca^{2+} and SO_4^{2-} polyanions as dual cross-linking agents respectively. Those developed formulations were optimized using factorial 3^2 designing method and thereby evaluated for particle size, drug entrapment efficiency, percent yield, degree of swelling and in-vitro drug dissolution studies (with and without rat caecal content) etc. The obtained particulates were found to be spherical, free flowing, and had a mean particle size ranging from 1.24 μm to 1.32 μm , whereas percent yield was found between 72.87 to 82.13% and in-vitro release was found from 76 to 95% approximately at the end of 24 hr studies. The batch formulations had shown good sustained release effect at the in-vitro level and may be promising to achieve greater site specificity for targeting to colonic specific region.

Keywords: Polysaccharides, ionic gelation, biodegradable, chitosan, pectin, in-vitro release, colon targeting.

**FRACTIONATION AND CHARACTERIZATION OF ANTIOXIDANT
CONSTITUENTS FROM MURRAYA KOENIGII LEAVES.**

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ABSTRACT

In the present work an attempt has been made to isolate and characterize biologically active constituents from the leaves of plant. *Murra koenigii*. The preliminary phytochemical analysis suggest that leaves of plant might contains some crystalline glycosides, proteins, minerals, organic acid and carbazole compounds such as koenigin, iso-koenine, koenioline, koenidine, murrayaline, murrayazolidine, xynthyletin, mahanimbine, tetrahydromahanimbine etc. In order to isolate biologically active compound/s the plant material was subjected to fractionation method. The antioxidant activity of different extracts and fractions of *Murra koenigii* leaves were tested spectrophotometrically by DPPH assay method. It was observed that methanol fraction showed higher concentration of antioxidant molecules. Then different fractions of methanol extract were subjected to thin layer chromatography method for testing of quality and purity of compounds. Two compounds, compound-A and compound-B were separated and characterize by infrared, ultraviolet, H(1)-nuclear magnetic resonance (NMR), C(13)-NMR and LC-MS spectral methods.

Key words: Antioxidant activity, DPPH, *Murra koenigii*, koenigin, spectroscopic method.

**FORMULATION AND EVALUATION OF TRANSDERMAL PATCH FOR
ATOMOXETINE HYDROCHLORIDE**

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ABSTRACT

The aim of this study was to develop transdermal patch of Atomoxetine hydrochloride which has good mechanical properties. Different groups of films with drug were prepared using different amalgamations of polymers such as like HPMC (various grades), Polyox303, Eudragit RL 100. Considering solubility of drug and polymer, the solvent system of water: ethanol was chosen. In-vitro release of drug substance was performed in 0.1 N HCl solution (pH-1.2) for two hours & phosphate buffer solution (PBS) pH 6.8 for the rest of the period. Compatibility of drug with different excipient (drug: excipient in the ratio 1:1) was carried out using Fourier Transform Infra-Red Spectroscopy (FTIR). Evaluation test such as weight variation, content uniformity, drug content, folding endurance, thickness, in-vitro dissolution and in-vitro disintegration were done. The folding endurance of the all batches found less than 500 times. The percentages of drug distribution was found in between 72 to 100%. The formulation F4 containing 600mg polymer showed maximum drug release of 95.26%. The method employed to prepare patches was capable of producing patches with almost uniform drug distribution. Stability studies were conducted as per ICH guidelines ($40\pm 2^{\circ}\text{C}$ at $75\pm 5\%$ RH) for optimized formulations and was found to be stable.

Keywords: Atomoxetine hydrochloride, Transdermal Patch

**FORMULATION AND EVALUATION OF FLOATING TABLET OF
TROPISETRON**

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ABSTRACT

The purpose of this research was to develop a novel gastroretentive drug delivery system based on controlled delivery of active agent. Tropisetron is an indole derivative having the antiemetic activity. It's a selective serotonin receptor antagonist. Tropisetron blocks the action of serotonin at 5HT₃ receptors. It also results in suppression of chemotherapy-and radiotherapy-induced nausea and vomiting. The incorporation of swellable and natural polymer for binding action and also good water solubility with high molecular weight such as carbopol present it in the gastro retentive floating tablets, which are designed to provide the desired controlled and complete release of drug for prolonged period of time. Lactose was used as filler. Buoyancy was achieved by adding an effervescent mixture of sodium bicarbonate and anhydrous citric acid. Floating tablets were prepared by direct compression method. All the required evaluation parameters such as hardness, friability, drug content uniformity and swelling index were performed and found within the acceptance limit. The optimized formulation (F7) exhibited 63.87% drug release in 12 hrs emerged as best formulation based on drug release characteristics.

Keywords: Floating Tablet, Tropisetron

**FABRICATION AND EVALUATION OF HERBAL HAIR GEL CONTAINING
ZIZIPUS JUJUBA, HIBISCUS AND PIPER NIGRUM**

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ABSTRACT

Hair is an imperative part of human body. Various synthetic compounds, chemicals, and their derivatives have been proved to cause destructive effects. A number of herbal principles have been commended with hair growth promoting action and formulating them into appropriate cosmeceuticals can be well acknowledged as far as the patient compliance is concerned. The objective of the present research work was to develop a hair gel formulation with Black pepper (*Piper nigrum*) which is often used in Ayurvedic medicines and it stimulates hair follicles causing growth, and with Hibiscus leaves extract which is known as a hair growth promoter and a hair conditioner as well. The formulations also contain *Ziziphus jujuba* leaves extract, which has been reported possessing antibacterial activity which makes it beneficial against dandruff and scalp infections. Along with extracts of *Ziziphus jujuba* and Hibiscus leaves and Black Pepper seeds (3% w/w each). All the ingredients used to prepare the hair gel was found harmless and the physicochemical assessment showed ideal results, but advance research is required to perceive its hair growth promotion property.

Keywords: *Ziziphus jujuba*, *Piper nigrum*, Hibiscus, Hair Gel

**3D PRINTING TECHNOLOGY IN PHARMACEUTICALS AND BIOMEDICAL: A
REVIEW**

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ABSTRACT

3D printing is also known as additive manufacturing, which is the potential way to transform the manufacturing as well formulation in pharmaceuticals and biomedical industries. Three-dimensional (3D) Printed medicines are revolutionising the pharmaceutical market as potential tools to achieve personalized treatments adapted to the specific requirements of each patient, taking into account their age, weight, comorbidities, pharmacogenetic, and pharmacokinetic characteristics. Additive manufacturing or 3D printing has wide range of techniques which are classified in many categories but most commonly used in the 3D printing of medicines are: printing-based inkjet systems, nozzle-based deposition systems, and laser-based writing systems, in addition to both polymer filaments and hydrogels as materials for drug carriers.

Keywords: 3D printing, Additive Manufacturing, Bioprinting, Drug delivery, Medical devices

**ANTI-ALZHEIMER ACTIVITY OF HYDROALCOHOLIC EXTRACT OF
BUTEA MONOSPERMA LEAVES**

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ABSTRACT

Objective: The key objective of the study is to evaluate Anti-Alzheimer activity of hydroalcoholic extracts of Butea monosperma leaves (BMLE) by streptozotocin induced Alzheimer. Butea monosperma (Lam.) is medium size tree belonging to family Leguminosae. It is reported to have numerous uses in the indigenous system of medicine in India.

Material and Methods: AD was induced by streptozotocin i.e. STZ (3 mg/kg, ICV) day 1st and 3rd day after surgery. Surgery was done on anesthetized rats by the help of stereotaxic apparatus. STZ induced AD rats were treated with ethanolic extracts of Butea monosperma (100 and 200 mg/kg, p.o.) for 14 days. Effect of BMLE in AD rats were assessed by estimating inflexion ratio in EPM and the alteration in the behavior (Y maze apparatus), biochemical parameter in the brain tissue acetylcholinesterase (AChE) .

Result: The preliminary phytochemical investigation of BMLE showed the presence of carbohydrates, alkaloids, flavonoids, phenols, tannins, saponins, fixed oil, vitamin C, proteins and amino acids. Extracts at dose levels of 100 mg/kg and 200 mg/ kg showed a significant elevation in inflexion ratio in elevated plus maze and elevation in percentage alternation in Y-maze model. A significant decline in brain AChE level was noted in animals treated with extracts in both models.

Conclusion: These results suggest that, the Anti-Alzheimer effect of BMLE might be due to enhancement of cholinergic neurotransmission through inhibition of AChE activity.

**TARGETED NOVEL BRAIN DELIVERY USING LIPOPROTEIN COATED
ANTICONVULSANT NANOPARTICLES AND ITS BIODISTRIBUTION STUDIES
IN BRAIN AND LIVER**

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ABSTRACT

Pharmaceutical nanotechnology has become one of the fastest growing research areas. Distinctive advantages provided by nanocarriers are site specific delivery, prolonged action, lesser side effects, enormous drug carrying capacity, more effective than conventional dosage forms etc. The present work was aimed at developing angiopep-2 anchored nanoparticulate formulation which may improve the efficacy of antiepileptic drugs carbamazepine (CBZ) with longer circulation time with lesser side effects of drug into blood and directly targeting to the specific seizure sites in the brain. To achieve the above target, lipoprotein coated ε-caprolactone nanoparticles loaded with CBZ were developed and characterized. The average particle size of the formulation was found to be 96 nm, with an acceptably good polydispersity index (PDI < 0.16). The charge values were close to a neutral state with slight negative charges distributed around the nanoparticles (-3.28±0.75 mV). Drug loading was found to be 64%. In vitro drug release profile was observed an initial burst release for about 12 h, then the release rate of CBZ slowed down and became an almost zero-order release. The release rate during 48h was 77.9±2.5%. The in vivo potential targeting effect of formulation was determined using fluorescence of RBITC-labeled nanoparticles. The fluorescence signal in the brain of animal with formulation was much stronger at any time post-injection ranged from 2 h to 24 h. It is concluded that, this novel delivery system may act as an alternative to the traditional oral and IV delivery methods and will undoubtedly lead to a safer and more effective treatment to the patients of epilepsy.

Keywords: Angiopep-2, Carbamazepine, Drug Targeting, Epilepsy, Nanoparticles.

**MINI REVIEW: HERBAL MOSQUITO REPELLENT FORMULATION
FOR TEXTILES USING HERBAL EXTRACTS**

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ABSTRACT

Mosquitoes are small, midge like flies that constitute the family Culicidae, which transmit extremely harmful diseases such as malaria, yellow fever, Chikungunya, West Nile Virus, dengue fever, filariasis, Zika virus and other arboviruses, rendering it the deadliest animal family in the world. Many medicinal herbs and essential oils have been reported to have many pharmacological activities, one of which is their property to repel the mosquitoes. Essential oils are volatile mixtures of hydrocarbons with a diversity of functional groups, and their repellent activity has been linked to the presence of mono-terpenes and sesquiterpenes. A mosquito repellent is a substance applied to skin, clothing, or other surfaces which discourages mosquitoes from landing on that surface. Herbal repellents are cost effective, easily available and low toxic as compared to synthetic repellents.

Keywords: Repellent, mosquito, repellent, essential oil, Vector-borne disease.

MUCOADHESIVE SUSTAINED RELEASE FORMULATION OF LAMIVUDINE

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ABSTRACT

The aim of present study was to formulate & evaluate the mucoadhesive sustained release formulations of lamivudine. And to fulfil this aim, two mucoadhesive formulations- gels and tablets were prepared by using three different polymers: HPMC K15, poloxamer 407 & carbopol 934. Three mucoadhesive gel and nine tablet formulations were prepared and evaluated for various parameters. All prepared gel & tablet formulations had good physico-mechanical properties. Among all the formulations, carbopol gel and tablets showed the highest mucoadhesive force, although, each formulation had good adhesive force. All three gels were able to give sustained release up to 12 hours. Tablet formulations, so from this study, it is concluded that mucoadhesive formulations of lamivudine can be prepared for sustaining its release. And the successful outcome of the present study also encourage for further studies to assess the ability of the mucoadhesive formulations of lamivudine in providing an effective sustained and safe therapy for AIDS.

Keywords: Lamivudine, HPMC K15, Poloxamer 407 & Carbopol 934. Mucoadhesive Gel,

**IN SILICO REVERSE DOCKING STUDIES FOR THE IDENTIFICATION OF
POTENTIAL OF BETANIN ON SOME ENZYMES INVOLVED IN DIABETES AND
ITS COMPLICATIONS.**

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ABSTRACT

Diabetes and its complication results from metabolic disorders arise due to involvement of number of enzymes. The drug discovery and development involve targeting chemical entities to potentially elicit the inhibitory activity on such enzymes. In the present work enzymes were downloaded from protein data bank (PDB) and docked against energy minimized betanin molecule isolated from the beet root using mollegro software. The MolDock result indicated that the molecule is active against enzymes in the decreasing order aldose reductase PID: 4GQQ (- 191.486), alpha amylase PID: 4GQQ (-176.7), protein tyrosine phosphate PTP1 β PID: 2F70 (-148.693), alpha glucosidase PID: 5NN8 (-144.983), dipeptidyl peptidase DPP-IV PID: 2RIP (-133.45). Betanin is active against all the possible enzymes involve in diabetes and its complication.

Keywords: Ziziphus nummlaria, Antidiabetic potential, Saponin, Alpha amylase activity.

**ANTI-DIABETIC AND ANTIOXIDANT POTENTIAL OF SAPONIN EXTRACT OF
LEAVES OF ZIZIPHUS MAURITIANA**

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ABSTRACT

Object: The saponin extract of *Ziziphus mauritiana* was screened for antidiabetic and antioxidant potential.

Method: The methanolic extract of leaves of *Ziziphus mauritiana* was solvent extracted with water saturated n-butanol. Both the layer were separated and the organic layer was acidified with 1 N KOH to obtain the raw saponin extract. The different concentrations of saponin extract were treated with alpha amylase enzyme and 1% starch solution in phosphate buffer (pH 6.9). Spectroscopic estimation of incubated extracts was done at 540 nm after stopping the reaction with di nitro salicylic acid reagent. The antioxidant activity of extract was evaluated by reducing power assay. The saponin extract was mixed with equal volume of phosphate buffer (pH 6.9) and potassium ferricyanide (1%). The mixture was heated and treated with trichloro acetic acid (10%), which was further centrifuged and spectroscopically estimated at 700nm on the addition of freshly prepared ferric chloride solution (0.1%). The increase in absorbance as compare to standard indicates increase in reducing power.

Result: The saponin extract have produced significant alpha amylase enzyme inhibition and reducing capacity potential. The IC₅₀ value was observed to be 82.12µg/ml ± 0.60 and the reducing capacity was observed to more than standard Ascorbic acid.

Conclusion: Saponin extract were found to be active towards alpha amylase inhibitory activity and elicit the reducing potential which significantly indicates their potent antioxidant activity.

Keywords: *Ziziphus mauritiana*, Antidiabetic activity, Antioxidant activity, Saponin extract.

**FORMULATION AND DEVELOPMENT OF MICROPARTICLES CONTAINING
HERBAL PLANT EXTRACT**

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ABSTRACT

Diabetes cannot be cured completely. Incidence of diabetes mellitus increasing day by day. Synthetic drugs which are used for the treatment of diabetes have many side effects and frequency of dosing is more. To overcome such problems novel carrier system has been chose. Herbal extracts have been widely accepted as the potential medicines with less side effects as compared to synthetic drug molecules. Biodegradable polymers are having wide use for the preparation of vesicular system to control the drug release pattern of drugs. “Polymeric microparticles” considered as novel carrier technique to control the release of herbal plant extracts from vesicular system. Extraction of crude drug (Glycyrrhiza glabra) done with successive solvent extraction method by using different solvents like Petroleum ether, ethyl acetate, chloroform, methanol, and ethanol. In phytochemical screening we found different constituents but glycyrrhizin which is active constituent of roots, which have anti-hyperglycemic effect. Polymeric microparticles formulated with emulsification method. After characterization the microparticles shows good results of drug release and entrapment efficiency. In the current research work micoparticles has been developed of chitosan employed to enhance the drug release. Polymeric micopartcles were characterized and evaluated for antidiabetic activity. Glycyrrhiza glabra decrease the blood glucose level in albino rats.

Keywords: Microparticles, Antidiabetic

**DEVELOPMENT AND CHARACTERIZATION OF CORE SHELL
NANOPARTICLE FOR ENHANCED DRUG DELIVERY TO TREAT SOLID
TUMORS: PREPARATION AND IN VITRO ASSESSMENT**

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ABSTRACT

Mortalities from cancer in the world are projected to continue rising, with an estimated 9 million and 11.4 million people dying from cancer in 2015 and 2030, respectively. Rates are rising as more people live to an old age and as mass lifestyle changes occur in the developing world. With present treating regimen for cancer, dose-limited toxicity is a big reason that reduces the efficacy of cancer treatments. In search for more effective cancer treatments, nanosized drug delivery systems, those are capable of delivering their drug payload selectively to cancer cells such as nanoparticles, solid lipid nanoparticles, liposomes are among the most promising approaches. core shell nanoparticles are one of the investigated moieties in recent years that are seeking much attention nowadays for biomedical applications including the field of oncology. The present work we aims at developing a core shell nanoparticle comprising Poly (D, L –lactide –co –glycolide) (PLGA) core and polyethyleneimine (PEI) shell loaded with anticancer bioactive docetaxel (DTX) for passive targeting of the tumor tissue. It is expected that incorporation of PEI will improve the uptake and subsequent release of the drug in the cytosol due to endosomal escape phenomenon.

Keywords: Solid tumor, nanotechnology, nanoparticle, endosomal escape

SPERM IMMOBILIZATION POTENTIAL OF SAPONIN EXTRACT OF ZIZIPHUS MAURITIANA.

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ABSTRACT

Object: The contraceptive potential of Saponin extract of *Ziziphus mauritiana* is evaluated by human sperm immobilization assay.

Method: The leaves of *Ziziphus mauritiana* were subjected to successive solvent extraction. The dried methanolic extract was further solvent extracted with water saturated n-butanol and both the layers were separated. The organic layer was acidified with 1 N KOH to obtain the raw saponin extract. The extract was screened for spermicidal activity against human spermatozoa. The immobilization assay was performed on human ejaculate in 1:1 ratio according to modified waller method. Concentration showing motility inhibition was subjected to sperm viability assay using bakers medium. The sperm cell plasma membrane integrity study was done using hypo-osmotic swelling (HOS) test.

Result: The saponin extract at 0.1mg/ml & 0.5mg/ml concentration immobilize 80.68% to 100% and none of the spermatozoa recovered their motility in revival assay. The decrease in sperm viability was observed in range 35.6-56.68%. Significant morphological changes were observed under phase contrast microscope.

Conclusion: The present study has pointed out that saponin extract shows good human spermatozoa immobilization capacity at concentration 0.5mg/ml. The damage to the sperm membrane architecture and impairment of functional integrity of the plasma membrane was evidenced by significant reduction in sperm viability and tail curling.

Keywords: *Ziziphus* Species, Sperm Immobilization, Human Spermatozoa, Saponin.

**FORMULATION AND IN-VITRO EVALUATION OF ORODISPERSIBLE
TABLETS OF TELMISARTAN**

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ABSTRACT

Orodispersible dosage forms are used for accurate dosing, enhanced bioavailability, rapid action, patient compliance, ease of administration, enhanced palatability. Telmisartan is an antihypertensive drug which belongs to the class of Angiotensin Receptor II antagonist. It is a poorly soluble drug (BCS class-II) and the rate of absorption is limited by the dissolution rate. The reported bioavailability of drug is about 42%. In the present study an attempt was made to develop Oral dispersible tablets of Telmisartan formulated with super disintegrating agent with superior dissolution properties. The aim is to formulate various batches of oral disintegrating tablets of Telmisartan by using different superdisintegrants such as Indion 414, Indion 234 and Kyron T 314 with different concentrations individually by using different excipients like Mannitol, magnesium stearate and aspartame. Formulations of P1 to P13 are formulated with different superdisintegrants by wet granulation technique. The tablets were evaluated for the pre-compression parameters such as bulk density, compressibility, angle of repose etc. and post compression parameters like hardness, weight variation, friability, disintegration time and in-vitro dissolution profiles. Drug content for all formulation batches i.e. P1-P13 was found to be in the range of 99.76%-102.23%. Based on the evaluation of all parameters, the formulation P5 were found to be best on the basis of following crucial factors like hardness, drug content, disintegration time (14.4 sec) and wetting time.

Keywords: Superdisintegrants, Orodispersible tablet, Wet granulation

**FORMULATION AND EVALUATION OF SUBLINGUAL TABLET OF
VENLAFAXINE HYDROCHLORIDE FOR THE TREATMENT OF DEPRESSION**

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ABSTRACT

The objective of preparing sublingual tablet of Venlafaxine hydrochloride as sublingual formulations as it is very patient friendly as compared to the conventional tablets. Sublingual tablet formulation was proposed to be developed for Venlafaxine hydrochloride to enhance the bioavailability by avoiding first pass effect. Crospovidone and sodium starch glycolate used as superdisintegrants. Lactose was used as glidant and mannitol as directly compressible filler. Microcrystalline cellulose used as tablet disintegrant. The sublingual tablets were prepared by direct compression method. Seven formulations (S1-S7) were prepared and evaluated for thickness which ranges from 1.91 to 2.21, hardness ranges from 2.6 to 3.4 kg/cm², friability 0.71% to 0.90%, weight variations, wetting time ranges from 32-69 seconds disintegration time ranges from 29 to 57 seconds and in vitro drug release ranges from 70.7 to 98%. Formulation F-7 containing crospovidone (15mg) emerged as best formulation based on drug release characteristics.

Keywords: Sublingual tablets, Venlafaxine hydrochloride, Depression, Crospovidone

**MEMORY ENHANCING ACTIVITY OF HYDROALCOHOLIC EXTRACT OF
BRASSICA OLERACEA ON SCOPOLAMINE INDUCED AMNESIC RATS**

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ABSTRACT

Memory is the retention power of information in the brain. of Brassica oleracea commonly called 'Broccoli' has been known for its anti-inflammatory action. In this investigation, memory enhancing activity of Brassica oleracea is to be undertaken. Two doses of the drug Brassica oleracea extract (100 mg/kg and 200 mg/kg p.o) were selected after acute toxicity studies were subjected for the evaluation of cognition and memory enhancing paradigm against scopolamine (0.4mg/kg, i.p) induced amnesic albino rats. Piracetam (120 mg/kg i.p) served as standard drug for both the models (Elevated T maze, Passive avoidance test) undergoing investigation. Brain Anticholinesterase activity was observed as biochemical parameter for estimation. Both dose (100 mg/kg & 200mg/kg) of Brassica oleracea extract has shown dose dependent notable decrement in Transfer latency (TL) by EPM, reduced Anti Cholinesterase activity in brain signifies improved learning when compared to the test scopolamine group. Sub-acute long term treatment was found to be more significant than acute i.e. short term treatment on cognition and memory enhancing activity.

Keywords- Brassica oleracea, Cognition, Scopolamine Anti Cholinesterase, Amnesia

QSAR STUDIES OF QUINAZOLINE DERIVATIVES AS ANTICANCER ACTIVITY

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ABSTRACT

The article describes the development of a robust QSAR model and the investigation of structure activity relationship analysis of quinazoline derivatives as anticancer activity. The statistically significant QSAR model having $r^2 = 0.7299$ and $q^2 = 0.6984$ with $\text{pred}_r^2 = 0.7128$ was developed by MLR method. The activity were converted to $-\log\text{IC}_{50}$, was used as dependant variable. The equation showed that the partition coefficient descriptor that relates to the lipophilicity of the molecule. The molar properties of the compounds suggest that the less bulky molecules and the will be advantageous to the anticancer activity. The information derived from the present study may be useful in the design of anticancer activity.

Keywords: QSAR, Quinozolines.

**PHARMACEUTICAL NANOTECHNOLOGY: AN OPPORTUNITY IN PHARMACY
FIELD**

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ABSTRACT

Pharmaceutical Nanotechnology encompasses applications in nanoscience to pharmacy as nanomaterials, and as campaign like imaging, diagnostic, drug delivery and biosensors. The drug delivery system clearly influences the rate of absorption, metabolism, distribution and excretion of the drug or other related chemical substances in the body. In accumulation to this the drug delivery system also allows the drug to bind to its target receptor and influence that receptor's signalling and movement. Stimulatingly pharmaceutical sciences are using nanoparticles to reduce toxicity and side effects of drugs and up to recently did not recognize that carrier systems themselves any enforce risks to the patient. Pharmaceuticals have been linked with different types of dendrimers which are large and compound molecules to fight from cancer. Drug deliver and associated pharmaceutical enlarged in the context of nanomedicine should be observed as science and technology of nanometer scale complex systems, comprising of at least two components, one of which is a pharmaceutically active ingredient.

Keywords: Nanoscience; Nanomedicine; Nanotechnology; Biosensors; Nanometer scale

**HQSAR, COMFA AND COMSIA ANALYSES OF ISOQUINOLINE DERIVATIVES
AS ANTI DIABETIC AGENTS**

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ABSTRACT

Type 2 diabetes (T2D) is a disease which affected millions of people Worldwide. Many drugs to treat T2D are available and now the inhibition of enzyme dipeptidyl peptidase-IV (DPP-IV) expected to be a hopeful treatment of T2D. In this research work we performed 2D and 3D QSAR of a series of forty isoquinoline derivatives. The methodologies used are HQSAR (Hologram Quantitative Structure–Activity), CoMFA and CoMSIA analyses with the objective of identifying the important structural features of the compounds that are significant for the DPP IV inhibitory activity. Significant correlation coefficients of the best 2D and 3D models were obtained, showed the predictive capability of above models for untested compounds. The results of HQSAR are in good confirmity with the results of CoMFA and CoMSIA.

Keywords: Type 2 diabetes, 3D QSAR

**EFFECT OF CARICA PAPAYA LEAF EXTRACT ON PLATELET COUNT IN
PATIENTS OF DENGUE FEVER WITH THROMBOCYTOPENIA**

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ABSTRACT

Thrombocytopenia in dengue fever is a common and serious complication. However, no specific treatment is available for dengue fever induced thrombocytopenia. In few countries (Pakistan, Malaysia, Sri Lanka and other Asian countries) the leaf extract of Carica papaya has been effectively used for thrombocytopenia. The management of dengue virus infection is essentially supportive and symptomatic. It has been reported that several plant species prevent complication of thrombocytopenia but do not cure dengue. Carica papaya (CP) otherwise known as the papaya pear is found in most tropical and subtropical countries of the world. The fruits of papaya are much sought after by human as valuable foodstuff and have anti-hypertensive activity. The leaves of papaya have been shown to contain many active components such as papain, chymopapain, cystatine, tocopherol, ascorbic acid, flavonoids, cyanogenic glucosides and glucocynolates. These components are related with anti-inflammatory activity. Carica papaya leaves extract is also found to have antitumor and immunomodulator activity. It has been also hypothesized that certain genes have been shown to influence platelet production and platelet aggregation, namely, the arachidonate 12-lipoxygenase (ALOX 12) also known as the platelet-type lipoxygenase as well as the platelet-activating factor receptor (PTAFR). An increase in activity of these genes is required for platelet production and activation. The ALOX 12 gene is strongly expressed in megakaryocytes and has been known to be responsible for the 12-hydroxyeicosatetraenoic acid (12-HETE) production of platelets. The PTAFR gene has been found to be expressed in megakaryocytes indicating that it could be a precursor for platelet production in addition to its well known role in platelet aggregation.

Keywords- Thrombocytopenia, Carica papaya, Dengue, Platelets.

**FORMULATION AND EVALUATION OF FAST DISSOLVING FILMS OF
GRANISETRON HYDROCHLORIDE**

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ABSTRACT

Granisetron hydrochloride is a novel serotonin 5-HT₃ receptor antagonist used as an antiemetic to treat nausea and vomiting following chemotherapy. It is well absorbed from the gastrointestinal tract, but its oral bioavailability is low (60%) due to extensive first-pass metabolism which makes it an ideal candidate for rapid release drug delivery system. In the present work we have prepared and evaluated fast dissolving oral films of Granisetron hydrochloride by solvent casting method using different concentrations polymers HPMC, PVA and their combinations. Mannitol was used as a disintegrating agent and Propylene glycol as a plasticizer. The prepared oral films were evaluated for Physical appearance, texture, Weight uniformity, thickness uniformity, percentage moisture absorption, disintegration time, drug content uniformity, folding endurance, tensile strength, in-vitro drug release, and stability studies. In-vitro release rate of Granisetron hydrochloride was studied in phosphate buffer pH 6.8. F1, F5 and F7 showed maximum release rate about 94.95%, 95.98% and 96.29% in 180 seconds respectively, whereas F3 showed 60.98%. Short term stability studies of selected films indicated that there is no significant change with respect to physical appearance, disintegration time, drug content and in-vitro drug release.

Keywords: oral films, granisetron hydrochloride, HPMC, PVA, fast dissolving.

**EXTRACTION AND HEPATOPROTECTIVE ACTIVITY OF PTEROSPERMUM
ACERIFOLIUM ON ANTITUBERCULAR DRUG INDUCE TOXICITY IN SWISS
ALBINO MICE**

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ABSTRACT

Present study deals with the extraction and hepatoprotective activity of *Pterospermum acerifolium* on antitubercular drug (Isoniazid and Rifampicin) induce toxicity in swiss albino mice. The leaves of *Pterospermum acerifolium* were subjected to maceration using hydro alcohol as solvent in the ratio 3:7 for 7 days. Toxicity study is performed on swiss albino mice at the different dose 1/20th, 1/10th and 1/5th of 100, 200 and 400 mg/kg body weight. The effect of extract on biochemical parameters against INH+RIF induced hepatotoxicity in mice were studied. In animals treated with INH+RIF level of SGOT, SGPT, ALP and Bilirubin was found to significantly high ($P<0.05$) as compared to vehicle treated group. In extract treated group level of SGOT, SGPT, ALP and Bilirubin was found to be significantly less ($P<0.05$) as compared to INH+RIF treated group. It can be concluded that hydroalcoholic extract of leaves of *P.acerifolium* possess significant protective potential activity against INH + RIF induced hepatotoxicity.

Keywords: INH+RIF induced toxicity, hepatoprotective, flavanoids, *Pterospermum acerifolium*, Biochemical evaluation.

**FORMULATION AND EVALUATION OF FAST DISSOLVING ORAL FILMS OF
AN ANTI-MIGRAIN DRUG (ZOLMITRIPTAN)**

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ABSTRACT

Zolmitriptan known anti-migrain activity. The fast dissolving oral film of drug Zolmitriptan was designed in order to relief and ease the pain caused to patient suffering from Migraine followed by nausea , vomiting and sensitivity towards light/sound. The oral Film was prepared using HPMC (Hydroxy Propyl Methyl Cellulose) as polymer and PEG as plasticizer by solvent casting method. The aim of preparing fast dissolving oral film of drug zolmitriptan was to have better Bioavability, quick onset of action (quick relief) and to prevent first pass metabolism. These oral films are self- administered and easy to swallowed by elderly patients or children without the help of water as medium to dissolve. Films were subjected to physicochemical characterization such as thickness, weight uniformity, folding endurance, drug content, and stability studies. Films were found to be satisfactory when evaluated for thickness, weight uniformity, folding endurance, drug content. The surface pH of all the films was found to be neutral.

Keywords: Zolmitriptan, Fast dissolving, HPMC.

**DEVELOPMENT AND CHARACTERIZATION OF FLOATING MICROSPHERES
DRUG DELIVERY SYSTEM FOR EFFECTIVE MANAGEMENT OF PEPTIC
ULCER**

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ABSTRACT

The purpose of present study to develop Gastro-retentive drug delivery formulation for enhancing GRT including the physiological and formulation variables affecting gastric retention. It is a widely employed approach to retain the dosage form in the stomach for an extended period of time including poor bioavailability. Floating microspheres were prepared by Solvent evaporation (oil-in-water emulsion) technique. In this 225mg polymethyl methacrylate (PMMA) were dissolved in a mixture of dimethyl formamide and dichloromethane (1:1) at room temperature. and 75mg Nizatidine hydrochloride was added in the above mixture. This was poured into 250ml water containing 0.02% tween 80, maintained at a temperature 30-40°C and subsequent stirred at ranging agitation speed for 20 minute to allow the volatile solvent to evaporate. The microspheres formed were filtered, washed with water and dried in vacuum. The prepared Floating microspheres were characterized in different way like size distribution $131.4 \pm 1.6 \mu\text{m}$ and $89.5 \pm 1.4\%$ entrapment efficiency was found, In vitro floating test of optimized floating microspheres formulation was studied in SGF (pH 1.2). The percent Cumulative amount of drug release was found $87.2 \pm 2.6\%$ in SGF (pH 1.2), $90.2 \pm 3.5\%$ in SIF (pH 6.8) and $93.2 \pm 3.5\%$ in PBS (pH 7.4) upto 24 hrs. Stability studies were carried out with optimized floating microspheres formulation which was stored for a period of 45 days at $4 \pm 1^\circ\text{C}$, $25 \pm 1^\circ\text{C}$ and $40 \pm 1^\circ\text{C}$. Floating microspheres drug delivery system provides the possibility of enhancing the bioavailability and control the release of formulation exhibiting absorption by prolonging the gastric emptying time of the dosage form ensuring availability of drug at the absorption site for the desired period of time.

Keywords: Floating drug delivery systems, Gastric residence time, in vitro and in vivo.

**NANOCARRIER(S) AS AN EMERGING PLATFORM FOR BREAST CANCER
THERAPY**

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ABSTRACT

Nanocarrier(s) are the potential carrier to revolutionize breast cancer diagnosis and therapy. Development of nanocarrier(s) loaded with drug, which is targeted to the cancer cell using ligand mediated drug delivery system. Some therapeutic nanocarrier(s) have been approved for clinical use. There are only limited numbers of clinically approved nanocarriers that incorporate molecules to selectively bind and target cancer cells. Targeted drug delivery system is a unique approach for drug delivery to the appropriate site which is highly efficient, biocompatible, and non-immunogenic. The receptor mediated endocytosis is one of the targeting approaches specially for targeting anticancer drug to cancerous site. Breast cancer cells have overexpressed receptors like folate, transferrin, estrogen, human epidermal growth factor receptors (HER) which can be used for effective site specific drug delivery to cancerous cells using appropriate receptor specific ligand. This review examines some of the nanocarrier and discusses the challenges in translating basic research to the clinic and the potential predictive markers of resistance to HER2-targeted therapies in breast cancer, novel drugs and drug combinations, including the promise of immunotherapy.

Key words: Breast cancer, Nanocarrier, Tumor, Receptor, Nanotechnology, immunotherapy

**EVALUATION AND COMPARATIVE STUDY OF LENS ALDOSE REDUCTASE
INHIBITORY ACTIVITY OF LEAVES EXTRACTS OF MERREMIA
EMARGINATA, PERMOTREMA PERLATUM, TRIDAX PROCUMBENS AND
EUPHORBIA PROSTRATA: POTENTIAL FOR DIABETIC CATARACT
TREATMENT.**

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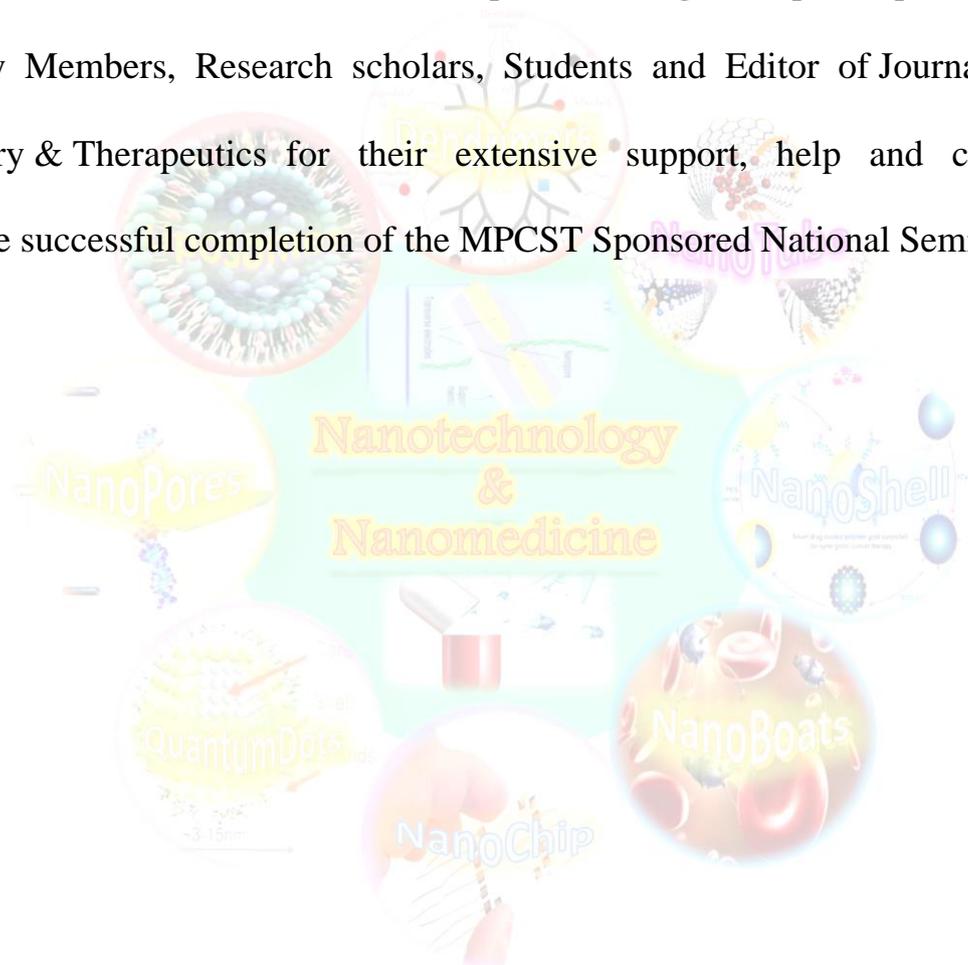
ABSTRACT

Introduction: The present research attempts at discovering an effective anti-cataract agent, focusing on evaluation of Aldose reductase inhibition (ARI) capacities of weeds and lichen. The present study was aimed at finding out the in vitro ARI activity of extracts of weed plants and lichen. **Methods:** ARI activities of the ethanolic extract of weed plants and lichen were evaluated using goat lens aldose reductase using Hayman and Kinoshita method. Evaluation was done using UV-Visible spectroscopy at 340 nm. **Results:** The extracts showed AR inhibitory activity at different extent. **Conclusion:** The study concludes the ARI capacity of leaves of Merremia emarginata, Permotrema perlatum, Tridax procumbens and Euphorbia prostrata which may be attributed to their flavonoid constituents and their extraction are solvent dependent. Thus Merremia emarginata leaves, Permotrema perlatum, Tridax procumbens and Euphorbia prostrata weed plant's leaves and lichen may therefore work as a base for the development of anticataract agent. And out of all extract Triadax procumbens showed maximum activity.

Keywords: Aldose reductase, Merremia emarginata leaves, Permotrema perlatum, Tridax procumbens and Euphorbia prostrata anti-cataract agent, weed plant, lichen, flavonoid.

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