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3.3.2 Number of books and chapters in edited volumes/books published and papers published in national/ international conference proceedings per teacher during last five years

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extremely bitter drug Ondansetron hydrochloride. Optimized taste masked drug complexes were examined through Fourier-transform infrared spectroscopy (FTIR) spectroscopy and Scanning electron microscopy, drug loading, in vitro drug-release properties, stability test as well as it was observed that drug Ondansetron hydrochloride, Aspartane and Mannitol were compatible. To troubleshoot issue of swallowing such formulation oral disintegrating tablet (ODT) and mouth dissolving film has been developed which rapidly disintegrate and dissolve in saliva and then easily swallowed without need of water which is problem-resolving over conventional dosage form. In the pharmaceutical industry regarded as the super convenient and economical method of drug delivery were taste masked-oral disintegrating tablet and mouth dissolving film.

A-34

FORMULATION AND CHARACTERIZATION OF MICRO BALLOONS OF PROTON PUMP INHIBITOR

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Objective: With a low half-life, proton pump inhibitors tend to breakdown in the acidic environment of the stomach. Therefore, it becomes vital to prepare a dosage form with sustained release that can protect the medicine from gastric pH and provide a prolonged effect. Materials and Methods: Microballoons were produced using emulsion solvent evaporation utilizing ethanol and dichloromethane as organic solvents and HPMC K15 and Eudragit S100a as polymers in varying proportions. Results and Discussions: Tap density ranged from 0.8030.36 to 0.9230.06, bulk density from 0.7410.04 to 0.8650.06, Carr's index from 3.87.7 to 1.041.08, and angle of repose from 14.8600.47 to 20.2500.71. The buoyancy test was between 72.680.37 and 83.470.28, drug entrapment was between 79.810.21 and 92.680.82, yield was between 79.200.28 and 89.380.25, and cumulative drug release was between 0.203 and 99.08%. The P4 microballoon batch had the highest drug content and drug release rate. Batch P4 was ideal due to its maximum drug entrapment efficacy of 92.680.82%, maximum drug content of 94.720.006 and 74.67% of drug release in 12 hours sustained release action. Microballoons with higuchi diffusion had zero-order kinetics. Conclusion: It was determined to be stable based on the stability study's finding that no significant changes were seen.

A-35

DESIGN AND EVALUATION OF CONTROLLED TRANSDERMAL DRUG DELIVERY SYSTEM OF TESTOSTERONE

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In the current Research, transdermal patch of testosterone was formulated .Main objective to treat hypogonadism was behind formulation development of controlled release aimed at designing once a day matrix diffusion system of testosterone transdermal patches for certain drug like testosterone .Two different approaches were used for preparations of transdermal testosterone patches : 1) Adhesive matrix diffusion controlled system 2) Polymer matrix diffusion controlled system .To get desired release and permeation rate of testosterone effect of polymer , amount of drug incorporated and polymer concentration on invitro drug release and in vitro drug permeation was studied .Best patches were selected on the results for invitro permeation studies stability and in vivo efficacy of transdermal testosterone patches were ascertained using castrated male rat as hypogonadal animal model .1)In vitro release of Adhesive matrix patch was found throughflux with patch containing 30% penetration enhancer cardamom oil showed 1.2 fold increase in enhancement through rat skin & drug permeation of transdermal patch with penetration enhancer 20% propylene glycol was the best candidate for transdermal delivery. 2) Polymer matrix diffusion patches with three combination out of which two formulation of polymer ethylcellulose :pvp and ethyl cellulose:peg 6000 with 30 % d - limonene and cardomom oil were evaluated for stability and in vivo as they showed excellent physicochemical properties and high in vitro permeation of test. No toxicity/ skin allergies was seen done through proven test .Shelf life of formulation A5T10PE2,P5T4LN3,P5T4CD3 and P5T4PE2 were found to be 5.22 years ,5.46 years and 5.39 years.

A-36

TARGETED DELIVERY OF RALOXIFENE HYDROCHLORIDE USING TRANSFERRIN FUNCTIONALIZED GRAPHENE NANORIBBON FOR BREAST CANCER TREATMENT

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Raloxifene Hydrochloride (RLX), a Selective Estrogen Receptor Modulator (SERM) class drug, possesses very low bioavailability and severe side effects. To ensure the complete a safe delivery of the drug to the breast tumor, GONRs are conjugated with transferrin (T protein. GONRs were synthesized by the longitudinal unzipping method and are characteriz by various techniques. DSPEPEG (DP) polymer is covalently attached toTrf,and the conjuga (DPT) is characterized by NMR and MALDI-TOF. Then the GONRs were modified by DPT or D The RLX loading to GDPT (GONR modified with DPT) and GDP (GONR modified with DP) w found to be very high due to the π - π interactions between the drug and GONR. The amou of transferrin attached was examined by the BCA kit assay method.Invitro drug release studi showed release of RLX from the carrier is pH dependent and sustained. The cytotoxici studies on MCF-7, MDA-MB-231 and SKBR-3 cell lines showed higher cell death in ER + MCF cell lines. GDPT-RLX shows more cytotoxicity compared to RLX and GDP-RLX. Cell uptake a apoptosis studies also confirmed the effect of transferrin conjugation on GONR carrier f breast cancer treatment.

A-37

DESIGN & DEVELOPMENT OF FLOATING BILAYERED ANTI-DIABETIC TABLETS USING TRIGONELLA FOENUM AS KEY EXCIPIENT

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The aim of the present study is to design and develop a bilayeredfloating tablets containin Glipizide and Metformin hydrochloride by using fenugreek as a natural gum in both a superdisintegrant and release retardantfor effective usage in the treatment of diabete mellitus.Glipizide, Metformin hydrochloride and Fenugreek Gum compatibility studies wer confirmed by IR spectral studies. Different bilayered floating tablets were formulated usin Glipizide in the immediate release layer using modified Trigonella as a superdisintegrant an Metformin hydrochloride in the sustained release layer by Trigonella gum as release rat retardant by direct compression method. Physical evaluation of bilayered floating tablets suc as weight variation, friability, hardness, swelling index and drug content were found to b satisfactory. The release pattern of all the formulations followed zero order kinetics an ascertained the Peppas mechanism, Further, it was observed that the release profile from th fenugreek as a release rate retardantwas governed by predominantnon Fickian diffusio ($p > 0.5$). The formulation F5 was considered as the best formulation since it produce 93.04% of the Glipizide drug release at the end of 25 minutes and 97.44% of Metformi hydrochloride at the end of 12 hours. The individual layer assessment in the floating bilayere tablet indicated that there was no severe impact of Metformin hydrochloride on Glipizide leading to toxic effects and further it could well maintain the therapeutic levels with Glipizide activity on the excess blood sugar levels. In vivo radiographic images of rabbit's abdomen on F5 found to be more than 10 hours.

A-38

DESIGN OF MICROSPONGE LOADED KETOCONAZOLE TOPICAL GEL BY QUASI EMULSION SOLVENT DIFFUSION METHOD

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In this research work microsponges using ketoconazole are prepared which is further loaded into a carbopol based gel. The main objective of this research work is to formulate and evaluate ketoconazole microsponge gel for topical delivery by using polymers such as eudragit S-100, eudragit L-100 in four ratios 1:2, 1:3, 1:4, 1:5 by quasi emulsion method.
The formulations prepared were labelled based on the ratios as ES 2, ES 3, ES 4 and ES 5 for eudragit S-100 and EL 2, EL 3, EL 4 and EL 5 for eudragit L-100. Evaluation tests like entrapment efficiency, production yield, drug content was performed and formulation of eudragit L-100 (EL 5) and eudragit S-100 (ES 5) showed better results. ES 5 and EL 5 formulations were optimized and tests like in vitro dissolution studies were conducted which showed that the formulation

A-87

ADVANCEMENT OF NANOTECHNOLOGY AND NANOMEDICINE IN DIAGNOSIS AND TREATMENT OF HUMAN DISEASES

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Nanomedicines are potential to combat several human diseases including cancer as well as infectious neurological, musculoskeletal, cardiovascular diseases. The objective to establish global roadmaps in nanomedicine is guided by the need to take care of life-threatening clinical issues. Nanotechnology in medicine include nanoadjuvants with immune modulatory properties used to deliver vaccine antigen. However, the same differences in physical and chemical properties of nanoparticles could lead to serious side effects for the human body including accumulation, mutagenic and oncogenic potential. In this review, author has reported that nanomedicine can be used for specific site targeting by being used in minute amount, conferring few toxic side effects. The Nanoknife is an invasive method of destroying cancer cells with high-voltage electricity. The c-nanotubes are helpful in repairing tissues and also help them to regenerate. Nanomedicine provides a strategy to deliver anticancer or immunotherapy drug in more targeted manner. The advancement in nanotechnology helps in the treatment of neuro-degenerative disorders such as Parkinson's disease and Alzheimer disease. Nanotechnology including quantum dots, photonic crystal, DNA chip as well as biodevice is applied to analysis of genome network in some diseases related cells. Nanomedicine boost immune response by serving as an adjuvant for vaccine therapy or drug carrier that help to target the tumour, while leaving normal cells untouched.

A-88

DEVELOPMENT AND EVALUATION OF COLON-TARGETED DRUG DELIVERY SYSTEM FOR NON-STEROIDAL ANTI-INFLAMMATORY DRUG

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Colon-targeteddrug delivery systems refer to the targeted delivery of drugs to the lower parts of GI tracts, mainly the large intestine. The main aim of the present work is to develop & evaluate colon-targeted drug delivery of celecoxib. The drug celecoxib, a non-steroidal anti-inflammatory agent used in the treatment of inflammation of the smooth muscle, was selected for the effective & safe therapy of ulcerative colitis. The Colon-targeted tablets were formulated by employing the direct compression method by using various excipients like gaur gum, HPMC K4M, MCC, talc & Magnesium stearate. Celecoxib enteric-coated tablet formulation F8 Prepared with gaur gum (30 mg) and HPMC K4M (75 mg), Showed acceptable properties like friability (0.35±0.02%), hardness (5.1±0.31kg/cm2), thickness (2.58±0.58μm), disintegration time (218.45±0.06sec) & uniform distribution of drug content (97.22±0.03%) which remain unchanged upon storage for 4 weeks. Eudragit L100 & S100 were the most successfully coated polymers. A coating ratio of 1:1 was selected for coating because it showed good results. The optimized formula for coating consisted of a 10% coating of tablets. It showed the highest drug release & lag time (192±0.643). So, Celecoxib tablets can be used in sustained delayed drug delivery in the treatment of ulcerative colitis, so as to reduce the side effects of the drug in the stomach & also to reduce the dosing frequency of the drug.

A-89

PHARMACEUTICAL MANUFACTURING SOFTWARE

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As a part of the healthcare field, the pharmaceutical sector is also innovating its processes to keep up its pace. The pharmaceutical industry has to be infallible, and thus needs to be monitored minutely to develop and manufacture reliable products with given quality standards. To help meet the quality, safety and regulatory requirements, pharmaceutical manufacturing software has come into action. This review gives an overview on different pharmaceutical manufacturing software, their features and importance in the industry. The use of software allows to streamline and scale up operations, while reducing costs and complying with stricter regulatory and customer requirements quickly and easily. The IT sector grabs various opportunities in the health care sector, it can reduce the manual work by managing various aspects of pharmaceutical industry and proper documentation by the use of software. With the ever-evolving pharmaceutical world use of software solutions are here to simplify the process. The pharmaceutical manufacturing software find solutions that reduce costs, improve efficiency and streamline operations. The software helps automate the manufacturing process and handles the challenges efficiently. With the onset of digitalization, pharmaceutical manufacturing software act as a lifeline for the industry and offers multi-functionality such as inventory management, planning, sales and purchase management and helps maintain the strict regulatory norms.

A-90

CHARACTERIZATION OF ALOE VERA LEAF POWDER AS CARRIER IN SOLID DISPERSIONS: FORMULATION & IN-VITRO EVALUATION

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In the present research solid dispersion of poorly water soluble drug, lansoprazole was prepared using aloe vera leaf powder as drug carrier. Solid dispersions with 1:1, 1:2, 1:3, 1:5 and 1:7 drug-carrier ratios were prepared by kneading method. Saturation and phase solubility was determined and optimized the drug: carrier ratio. Lansoprazole solubility in water was found 7.34 μg/ml, indicating poor water solubility drug. Compatibility of drug and carrier was confirmed by DSC & FT-IR study. Aloe vera leaf powder was characterized for swelling index, angle of response, hydration capacity etc. this shows ideal properties for preparation of solid dispersions. Powdered XRD study and Scanning Electron Microscopy indicated that, crystalline nature of drug converted to amorphous, this might be due to hydrophilic aloe vera leaf powder that improved wettability and dispensibility. Solubility of drug was improved in solid dispersion and increased with increasing concentration of carrier. Solid dispersion of 1:7 ratio showed highest solubility even that physical mixture of drug and carrier. Natural carriers are best alternate to synthetic excipients in preparation of various dosage forms. Here, also aloe vera leaf powder showed significant result in enhancement of solubility. Lastly it concluded that hydrophilic natural carrier is most promising excipient used as carrier in preparation of solid dispersion.

A-91

DEVELOPMENT OF SELF MICROEMULSIFYING SYSTEM FOR ZIPRASIDONE HYDROCHLORIDE

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Ziprasidone HCl (ZPR) is atypical anti-psychotic agent used in the acute and longterm treatment of schizophrenia and manic symptoms of bipolar disorder. The commercially available ZPR formulation is in oral capsule in the dose range 2080mg. The objective of the present study is to enhance oral bioavailability of ZPR by using SMEDDS technique. Different L SMEDDS formulations were prepared by selecting the varied concentration of oil (25% to 65%w/w), surfactant (35% to 75%w/w), and co-surfactant (0 to 25% w/w) i.e., Ethyl oleate Tween 80, PEG 600 respectively from the pseudo ternary phase diagram. The self-micro emulsification properties, droplet size, and zeta potential of these formulations were studied upon dilution with water. To determine the effect on the self-emulsifying properties after conversion, the dissolution characteristics of the solid intermediates of SMEDDS filled into hard gelatin capsules were examined and compared with pure drug and commercial formulation. The optimized liquid SMEDDS formulation was converted into S-SMEDDS of ZPR powder by spray drying technology, using Aerosil 200 as adsorbing carrier. By using SEM, DSC and XRD, the solid-state characterization of the solid SMEDDS was accomplished. In-vitro dissolution test shows that SSMEDDS of ZPR capsule had a faster release rate. Stability studies ratified that the optimized S-SMEDDS capsule (SF4) was robust under accelerated conditions. Invivo studies in rats showed that S-SMEDDS capsule (SF4) increased bioavailability of ZPR compared to the pure drug and marketed formulation of ZPR. Hence SMEDDS serve as the promising formulation to meet the desired needs.

A-92

STABLE, PAINLESS AND EFFICACIOUS LYOPHILIZED PROPOFOL INJECTION

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Propofol is an intravenous anesthetic used for procedural sedation, during monitored anesthesia care, or as an induction agent for general anesthesia. It may be administered as a bolus or an infusion, or some combination of the two. Propofol is formulated as an oil-in-water emulsion because of its low water solubility. Despite the success of propofol emulsions, drawbacks to such formulations include inherent emulsion instability, injection pain, a need for

antimicrobial agents to prevent sepsis, and a concern of hyperlipidemia-related side effects. The marketed propofol emulsions are recalled. To overcome this drawback, the current research formulated a painless stable and therefore efficacious lyophilized propofol injection for intravenous administration using different solubilizers and solvents. This Lyophilized propofol injection has its own advantages such as stable storage conditions and short reconstitution time. After reconstitution of lyophilized injection a clear solution is formed. There is no significant change in 1 month stability study and shows promising result. The assay was found to be complying with the official monographs.

A-93

FORMULATION AND CHARACTERIZATION OF NOVEL SILVER/GRAPHENE OXIDE NANOCOMPOSITES FOR THEIR ANTIMICROBIAL ACTIVITY AND PACKAGING APPLICATION

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The major objective of the present study was to explore the antimicrobial potential and packaging application of silver/graphene oxide nanocomposites. Green synthesis of silver nanoparticles using ginger (Zingiber officinale) was selected because of its low toxicity, rapid production, and environment friendly nature. Three batches (F1, F2 and F3) of silver nanoparticles were synthesized from the ginger extract. From the obtained results, batch F1 was selected as optimized batch for further formulation. Ginger extract silver nanoparticles (batch F1) were then incorporated into PAA/GO matrix to prepare PAA/GO/Ag nanocomposites. After inclusion of silver nanoparticles in PAA/GO matrix and comparative evaluation of the antimicrobial activity of PAA/GO/Ag nanocomposites with that of standard (Tobramycin), indicated the comparable antimicrobial activity of PAA/GO/Ag. Zeta potential was observed in the stability range (-30mV to +30 mV). XRD studies revealed the crystalline nature of PAA/GO/Ag nanocomposites. Thermal studies depicted the thermal stability of PAA/GO/Ag nanocomposites and delayed degradation. Mechanical Properties showed that when silver nanoparticles were added to PAA/GO matrix, an increase in tensile strength and elongation at break was observed. FESEM exhibited the presence of silver nanoparticles over the surface of PAA/GO/Ag nanocomposites. Gas barrier properties revealed less oxygen permeability. Thus, from the obtained results, it is concluded that, the formulated nanocomposites may be used for their antimicrobial property as well as for packaging applications.

A-94

FOLATE AND CD44 RECEPTORS DUAL-TARGETING FOLIC ACID AND HYALURONIC ACID PACLITAXEL-LOADED POLYMERIC MICELLES FOR OVERCOMING SIDE EFFECT AND IMPROVING TUMOR DISTRIBUTION.

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The hydrophobic nature of most anticancer drugs makes choosing a mechanism for their efficient transport difficult. This is where micelles come into play since they provide a hydrophobic core for integrating these drugs. Tumor targeting and sitespecific drug release are critical features in cancer treatment. The purpose of this research was to formulate paclitaxel-loaded folic acid and hyaluronic acid conjugated pluronic F127 mixed polymeric micelles (PTX-FA(PF127)-HA(PF127)). Folate receptors and CD44 receptors, which are overexpressed in cancerous cells, were targeted using folic acid and hyaluronic acid. 32 factorial design was used to investigate the influence of formulation variables, quantity of conjugated Pluronic F127 (X1), and paclitaxel (X2) on the formation of 127 micelles to attain the required characteristics. The targeting ligands, Folic acid, and Hyaluronic acid were conjugated to Pluronic F127 by esterification reaction, and PTX-FA(PF127)HA(PF127) micelles were synthesized using the thin-film hydration method. The optimized batch was assessed for its size, zeta potential, percent drug entrapped (EE), in vitro release, hemolytic toxicity and in-vitro cytotoxicity studies. The optimized formulation showed a particle size of about 426 nm with EE 85%, and a sustained release behavior was observed compared to PTX solution. Erythrocytes were used to evaluate the hemolytic toxicity of PTX-FA(PF127)-HA(PF127) micelles and it was compared to the free drug. The percent hemolysis of PTX-FA(PF127)HA(PF127) micelles was less than that of the free drug. The in vitro anticancer activity of PF127-PTX and PTX-FA(PF127)-HA(PF127) micelles was evaluated in MCF-7 cancer cells. The micelles showed significant cytotoxic potential properties with the IC50 concentrations at 209.87ug/ml and 162.72ug/ml respectively. It can be concluded that PTX-FA (PF127)-HA(PF127) micelles can be considered as a potential carrier candidate for the delivery of anticancer drugs. Its targeting efficiency can be further studied to formulate the potential dual targeting drug delivery system.

A-95

CHALLENGES AND PROCESS OPTIMIZATION IN LIPID BASED NANOCARRIER SYSTEMS FOR BRAIN TUMOR TARGETING

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Drug conveyance to the brain generally stays a tough challenge for researchers because of the intricate construction and different obstruction systems encompassing the brain. The blood-brain barrier (BBB) acts to physically and physiologically block the medication, which complicates treatment options. The lipid nano carriers have been widely investigated for various central nervous system (CNS) diseases including brain tumor. Owing to their biocompatible nature, various lipid based nanocarriers like liposomes, solid lipid nano carriers, niosomes etc. Have acquired a lot of interest among scientific community for various brain and CNS related disorders. Across different lipid nanocarriers, solid-lipid nanocarrier stays to be the most secure, steady, biocompatible and cost-effective drug carrier system with high effectiveness. Further, ligands like proteins or peptides, carbohydrates, aptamers, antibodies, and antibody fragments can be generally conjugated to the surface of the lipid nanocarriers that bind specifically to an over expressed target on the brain tumor cell surface. The present study discusses on various lipid based nanocarrier systems investigated over the past years for the treatment of brain tumor. Various nanodrug carriers along with their surface modified forms for targeting brain tumor have been included in our study. Along with that, practical challenges faced in the formulation development and process optimization of lipid nanocarriers have been discussed briefly.

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FORMULATION, OPTIMIZATION, AND EVALUATION OF NANO-STRUCTURED LIPID CARRIERS FOR THE TREATMENT OF PSORIASIS.

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Psoriasis is a chronic, non-communicable immune-mediated inflammatory disease characterized by features like scaly, erythematous skin plaques caused due to infiltration of inflammatory cells resulting from the incomplete hyperproliferation of keratinocytes. Topical therapy, photo therapy are the first line treatment therapies selected based on the severity of the disease. However, they present some limitations like poor drug penetration, cumulative toxicity and potential drug interactions occurring due to treatments over long period of time. To overcome the limitations and have an optimal skin delivery, a topical formulation using nanostructured lipid carriers (NLC) as a drug delivery system was prepared by 'Hotmelt homogenization' method and it was then dispersed into a gel to form a NLC gel. The effects of independent variables on dependent variables were determined and the formulation was optimized using Box-Behnken design. The pre-formulation studies were carried out by performing FT-IR and DSC analysis, which indicated that the components of NLC were compatible with each other. The optimized formulation was characterized for particle size (PS), polydispersity index (PDI) and entrapment efficiency (EE) and it was found to be 130 nm, 0.172, and 80.15%, respectively. The optimized gel formulation will be evaluated for viscosity, pH, drug content, spreadability, extrudability, and in vitro drug release studies. The stability studies will be performed according to ICH guidelines. The formulation was then characterized by performing preclinical evaluation studies such as in vitro cell viability studies, cytotoxicity studies and anti-psoriatic efficacy studies to report the anti-psoriatic efficacy of the prepared NLC gel formulation.

A-97

DEVELOPMENT OF TERBINAFINE HYDROCHLORIDE NIOSOMAL IN SITU GEL FOR OPTHALMIC DRUG DELIVERY

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Background: Conventional liquid ophthalmic formulations exhibit low bioavailability of drug due to pre corneal factors associated with eye including nasolachrymal drainage and spillage during administration which leads to recurrent dosing. In addition to it, drug is absorbed through nasolachrymal duct into systemic circulation leading to unwanted side effects. Combination of

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FORMUALTION AND IN VITRO CHARACTERIZATION OF SUSTAINED RELEAE MUCOADHESIVE BUCCAL TABLET

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Rivastigmine Tartrate is a para-sympathomimetic or cholinergic agent, used to treat mild to moderate dementia caused by Alzheimer or Parkinson disease. It is subjected to an extensive hepatic first pass metabolism with systemic bioavailability of 36%. Its short half-life being 3-4 hours. The objective of the present study is to develop sustained release mucoadhesive buccal tablet for Rivastigmine Tartrate to overcome poor bioavailability (below 50%) due to extensive first pass metabolism, poor permeability from the GIT and shorter half life (2-6 hr.) by reducing the dosing frequency. Direct compression method was used to prepare buccal tablet. The prepared formulations were characterized for pre & post compression studies. The results of FTIR study revealed that there is no physical or chemical interaction between drug and polymer. Formulation Batch C-7 was selected as optimized batch which contain Rivastigmine Tartrate (3 mg), HPMC-K4M(120 mg), HPMC -K100 (140mg), Mannitol(100 mg), Magnesium stearate 2%. The optimized batch was showed evaluation result as, Weight Variation (251.6 ± 1.712), Hardness (8.36 ± 0.05) kg/cm2, Diameter (12.27 ± 0.115), Thickness (3.12 ± 0.002)mm, Friability (0.50 ± 0.01), Drug Content (98.93 ± 0.92)%, Muccoadhesive strength (38.34 ± 0.205)gm and Muccoadhesive force studies (3.76 ± 0.136)Dyne and cumulative drug release for 8 hours (43.60 ± 0.122). It was concluded that the prepared of Sustained release MuccoadhesiveBuccal tablet of Rivastigmine Tartrate may prove to be potential candidate for safe and effective Sustained release drug delivery over an extended period of time which can reduce dosing frequency.

A-109

FORMULATION AND EVALUATION OF DRONEDARONE FILM COATED TABLET

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Atrial fibrillation (AF) is the most prevalent arrhythmia. Recent epidemiological statistics from around the world have confirmed that atrial fibrillation is a global epidemic with negative long-term morbidity and mortality impacts. Amiodarone has been a treatment of choice for atrial fibrillation but it has a number of extracardiac side effects. Dronedarone, a benzofuran amiodarone derivative, has been structurally changed to minimize toxicity.Dronedarone oral absorption is difficult due to its pH-dependent water solubility. Dronedarone tablet was formulated with a dose of 400mg/tablet using the wet granulation method.The already existing formulation has solubilizer Poloxamer 407 which is less hydrophilic. The current invention involves different solubilizers such as S1, S2 and S3 out of which solubilizer S3 is more hydrophilic and is a super disintegrant which showed increased solubility with less concentration and hence becomes more cost effective. The dissolution rate of Dronedarone from the tablet dosage form consisting S3 as a solubilizer was more rapid and higher than the marketed product at 4.5 pH and hence the increased bioavailability of the formulation.

A-110

ENHANCEMENT OF AQUEOUS SOLUBILITY AND DISSOLUTION CHARACTERISTICS OF LORATADINE BY SELF NANO-EMULSIFYING DRUG DELIVERY SYSTEM (SNEDDS)

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Loratadine has a basic pKa of 3.83 and is a BCS class 2b compound with minimal solubility and oral bioavailability. Its solubility and dissolving properties were improved with the development of the Loratadine SNEDDS. By raising the surface area and reducing the droplet size, which are voluntarily edible, the SNEDDS are known for advancing the solubility and absorption of hydrophobic active drugs. Pseudo-ternary phase diagrams made up of various additives were drawn. Zeta potential and stability tests were checked for all SNEDDS formulations. The phosphate buffer pH 6.8 was used for the drug release investigation of SNEDDS and was contrasted with commercial tablet. When compared to the tablet that is currently on the market, SNEDDS' medication release was considerably boosted. The best solubility and dissolution rate of Loratadine were demonstrated by the SNEDDS containing Isopropyl myristate, PEG-400, and Propylene glycol. The results of the current study suggested [illegible] improving the solubility and dissolving properties of Loratadine might benefit from [illegible] development of SNEDDS.

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FORMULATION OF NANOSPONGE LOADED TOPICAL GEL FOR THE TREATMENT O[illegible] FUNGAL INFECTION

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Common skin disease like cutaneous candidiasis fungal infection is caused by Candida albicans fungi.Posaconazole is one of many antifungal agents that act on the fungal cell membrane which help kill the fungi. Posaconazole nanosponges are prepared by the solvent method with using Methyl-Beta Cyclodextrin polymer. Analytical tools used in Identification, Evaluation and Quantification include FTIR, UV-SPECTROSCOPY, and SCANNING ELECTRON MICROSCOPY. Evaluation Parameters for Nanosponge formulation like Particle size, % Drug content, % Entrapment efficiency of F4 formulation are to be 562.7 ± 0.036 nm, 98.71 ± 0.057%, and 99.24 ± 0.016%, respectively along with scanning electron microscopy study.viscosity, gelling strength, spreadability, pH studies, and in-vitro diffusion studies are evaluated for Nanosponge loaded gels & it's optimized formulation shows Viscosity 47879 ± 0.546 cps, Spreadability 13.09 ± 0.065 g.cm/s, pH 6.54 ± 0.004, gelling strength 11 sec. % Drug diffusion of the optimized batch was found to be 95.58 ± 0.079% up to 24 hr .Tests of skin irritation and formulation stability were conducted and found satisfactory .Consequently, Nanosponge-loaded gel provided topically controlled drug release.

A-112

CYCLODEXTRIN-NANOSPONGE-BASED INJECTABLE IN SITU FORMING HYDROGEL FOR THE CO-DELIVERY OF THE EFFECTIVE COMBINATORIAL DRUG REGIMEN TOWARDS BREAST CANCER AND TRIPLE-NEGATIVE BREAST CANCER THERAPY

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Breast cancer is the most prevalent type of cancer in women, causing an increased rate of mortality worldwide. 75% of all cases of breast cancer in women are caused by hormone dependent, ER-positive breast cancer. As a result, research is now focusing on developing efficient therapies to treat hormone-dependent breast cancer. The current research was undertaken to deliver mucoadhesive and thermosensitive cyclodextrin nanosponge based in situ hydrogel formulations to achieve a longer residence time at the tumor site, which provides the desired release profile of encapsulated drug moieties for an improved facilitated and efficient BC and TNBC therapy. Even though the selected drug candidates have marked anticancer potency the poor bioavailability associated with these drugs is a major concern. To overcome this, the drugs were incorporated into the CD NS prepared by the hot melt method which was then loaded into the in situ hydrogel formulation. DSC and FT-IR studies indicated that the components and drugs were compatible with each other. The XRD pattern revealed strong, sharp diffraction peaks that indicated the materials were crystalline. The λ max of the drugs was confirmed at 306 nm and 235 nm, respectively. The optimized in situ hydrogels will be evaluated for gelation temp and time, pH, viscosity, texture profile analysis, drug content, homogeneity, grittiness, and in vitro drug release. The stability studies will be conducted according to ICH guidelines. The Pre-clinical evaluation will be carried out by conducting in vitro bioadhesion study, in vitro cell viability study, cytotoxicity study, Pharmacokinetics study, and in vivo antitumor efficacy study to report the antitumor efficacy of combinatorial drug regimen

A-113

CYCLODEXTRIN NANOSPONGES BASED IN SITU GELLING SYSTEMS FOR THE CO-DELIVERY OF POLYPHENOLS FOR THE EFFECTIVE COMBINATORIAL DRUG REGIMEN FOR VAGINAL CANDIDIASIS

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Vaginal candidiasis (VC) is a clinical disorder prone to about 75% of women experiencing it at least once in their lifetime. Therapy for the management of VC includes oral and local administration of azole antifungal agents which are associated with side effects. Also

objective of present invention was the development of solid lipid oral formulation for patient compliance. Solvent emulsification evaporation method is used for preparation of solid lipid nanoparticles. Levosulpiride nanoparticles was prepared by solvent evaporation technique using ethyl acetate and acetone in 10:5 ratio as organic phase, glyceryl monostearate, Span 80 and PEG 400. The prepared microemulsion dispersion is lyophilized. The prepared SLN are evaluated for solubility, entrapment efficiency, drug loading, in-vitro dissolution studies and characterized by particle size, zeta potential, FTIR, DSC. The optimized batch containing (F 3) Levosulpiride: GMS: Span 80: PEG 400 in a ratio of 250 mg: 63 mg: 63 mg: 250 mg and (F 4) Levosulpiride: GMS: PEG 400 in a ratio of 250 mg: 63 mg: 250 mg showed improvement in solubility of levosulpiride over plain levosulpiride. The drug loading of the F 3 and F 4 formulation was found to be 73.00 %, 70.98 % and entrapment efficiency of F 3 and F 4 formulation was found to be 90.50 %, 89.44 % respectively. The optimized formulations showed improvement in solubility and in-vitro dissolution in distilled water and acidic buffer pH 1.2 as that of plain levosulpiride. The DSC curve of the pure drug levosulpiride shows that it is in crystalline anhydrous state, shows a sharp exothermic peak at 189.50 °C (ΔH-1042J/ g), corresponding to its melting point 183-186°C), and for the formulation peak is at 172.71 °C (ΔH-499j/g), for formulation F4 peak observed at 177.61°C (ΔH-504j/g). It suggest the change in physical state of the drug from crystalline to amorphous state. The change in crystallinity and possible hydrogen bond formation is confirmed by XRD and FTIR studies respectively for prepared SLN over plain drug. The study confirms enhancement in solubility and dissolution rate of levosulpiride by development of SLN

A-352

FORMULATION AND CHARACTERIZATION OF AN IN-SITU GELLING SYSTEM LOADED WITH NANOFIBERS OF MOXIFLOXACIN HYDROCHLORIDE

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Formulation and characterization of In-situ gelling system loaded with nanofibers of moxifloxacin hydrochloride for effective treatment of periodontitis. Authentication and compatibility study of drug and excipients was performed by using DSC, FTIR, and UV spectroscopy. Excipients for nanofiber formulation, chitosan, polycaprolactone, pullulan, polyvinyl alcohol, and polyvinylpyrrolidone were screened whereas for in situ gel, excipients used were carbopol 934p, methylcellulose, poloxamer 407, HPMC k15. Fabrication of nanofiber film loaded with moxifloxacin was carried out using the electrospinning technique and its optimization was done using 32 factorial design. The formulation was evaluated for drug entrapment efficiency which was observed in the range of 59.84 and 91.59%, drug content ranged between 59.65 and 96.32 and SEM was performed. Preparation of MOX nanofiber-loaded In-Situ gel formulation involved the incorporation of drug-loaded nanofibrous film into gelling polymers. A 32-factor design was used statisti ally to optimize the formulation parameters and evaluate its effects. Appearance, clarity, syringeability, gelation temperature, and gelling time of the gel were evaluated. Drug content was found to be 72.96 and 97.04 and In-Vitro, drug release studies showed the highest amount of drug release which is 96.97% in 12 hrs. Anti-microbial efficiency studies of In Situ gel exhibited antibacterial activity against E. coli and S. aureus. Thus, an efficient nanostructured dosage form has been developed and it opens up new avenues for the treatment of periodontitis using nanofiber-based therapeutics.

A-353

FORMULATION AND EVALUATION OF SELF NANO-EMULSIFYING DRUG DELIVERY SYSTEMS CONTAINING POORLY WATER SOLUBLE DRUGS

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Currently many formulation approaches such as micronization, complexion with cyclodextrin, solid dispersions, and Nano suspensions are being used to address the formulation challenges of poorly water-soluble drugs. Nearly 70% of new chemical candidates have low water solubility, resulting in poor oral bioavailability, high intra- and inter-subject variability, and a lack of dose proportionality. According to the World Health Organization (WHO). Drugs such as anti-diabetics, anti-cancer, and anti-inflammatory drugs can suffer from this problem. Self-nano-emulsifying drug delivery system is best option to avoid such kind of issue. SNEDDS are anhydrous homogenous liquid mixtures consisting of oil, surfactant, drug and co-emulsifier or solubilizer, which spontaneously form oil-in-water nano-emulsion of approximately 200 nm or less in size upon dilution with water under gentle stirring. The physicochemical properties, drug solubilization capacity and physiological fact considerably govern the selection of the SNEDDS components. The composition of the SNEDDS can be optimized with the help of phase diagrams, whereas statistical experimental design can be used to further optimize SNEDDS. SNEDDS can improve oral bioavailability of hydrophobic drugs by several mechanisms.

A-354

FORMULATION DEVELOPMENT AND EVALUATION OF ANTI-FUNGAL NIOSOMAL GEL OF LULICONAZOLE AND SALICYLIC ACID

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Niosomes are non-ionic stable vesicular systems, which can accommodate both hydrophobic and hydrophilic drugs. Noisome play an increasingly important role in drug delivery as they can reduce toxicity and modify pharmacokinetic and bioavailability. Luliconazole and Salicylic acid used as topical antifungal drugs.Antifungal agents used in dermatological diseases. Pharmaceutical fungicide used to treat mycosis such as athlete foot, ringworm and candidiasis. Topically applied niosomes can increase the residence time of drugs in the stratum corneum and epidermis, while reducing the systemic absorption of the drug. This drug is used in patients with tinea pedis, tinea cruris and tinea corporis. Foot fungal skin infections (tinea pedis, also called athlete's foot) is the most common fungal infection in the general population. Noisome containing both drugs was prepared by modified reverse phase evaporation technique using non-ionic surfactants (span60, span40) and cholesterol at different concentrations. six noisome formulations were prepared (F1-F6) and evaluated for surface morphology size, shape, entrapment efficiency and FTIR studies. The Niosomal dispersions were incorporated into the gel base to produce niosomal gel formulation. Niosomal gel evaluated for physical appearance, PH, Viscosity, entrapment efficiency, Drug content, Spreadability, Extrudability and In vitro drug release study by using Franz diffusion study and stability study.

A-355

FORMULATION OF NIOSOMAL BASED TRANSDERMAL GEL FOR ATTENTION-DEFICIT HYPERACTIVITY DISORDER

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Methylphenidate is a drug of choice used in the treatment of attention-deficit hyperactivity disorder in children and for narcolepsy. The aim of present study was to develop niosomal based transdermal gels for controlled delivery of methylphenidate for prolonged period of time. Methylphenidate has very low bioavailability due to extensive first pass metabolism. Bioavailability of methylphenidate can be improved by transdermal delivery systems as drug directly reaches systemic circulation avoiding first pass metabolism. Non-ionic surfactant vesicles (niosomes) with different ratios (1:1-3:1) were prepared by thin-film hydration method using rotary flash evaporator and then incorporated in to 3% w/v Carbopol 934 gel base. Niosomal based gel had good consistency, spreadability and pH was around 6.5. FTIR and DSC studies revealed that there were no physical and chemical interactions between drug and excipients. Niosomes were analyzed for morphological aspects like vesicle size, vesicle shape, drug content, entrapment efficiency and in vitro diffusion studies. Vesicles were spherical in shape having uniform size in range of 1-3μm. Formulation (F1) containing 1:1 ratio of mole/mole span 60 and cholesterol showed highest entrapment efficiency of 98.6% and drug content was found to be within the limits. In vitro diffusion studies were conducted using Franz diffusion cell with 7.4 pH phosphate buffer as diffusion media. The formulation F1 showed greater drug release of 98.73% in 9 h compared to other formulations which released less than 80 % of drug in 9 h. Flux obtained for F1 formulation was higher (0.012±0.002μg/cm2/hr) than those obtained for formulation F2- F6.

A-356

STABLE ESSENTIAL PHOSPHOLIPIDS SOLUTION FOR IV INJECTION

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Polyenylphosphatidylcholine (PPC) molecules from soybeans are extracted and included in essential phospholipids (EPL) in a very pure form. It differs from other phospholipids, lecithins, or extracts from other sources because 1,2 dilinoleoylphosphatidylcholine (DLPC) is the primary active component. A therapeutically significant efficacy-to-safety ratio is guaranteed by EPL's well-established method of action, therapeutic efficacy, and lack of toxicity. It has an impact on cellular processes that depend on membranes and demonstrates anti-inflammatory, antioxidant, antifibrogenic, anti-apoptotic, membrane-protective, and lipid-regulating actions. It expedites the improvement or return to normalcy of subjective symptoms, pathological, clinical, and biochemical results, hepatic imaging, and liver histology because of its favourable

effects on membrane composition and functions. EPL should be given to the liver alongside other treatment assessments. Lipid injectable emulsions are effective drug delivery vehicles due in large part to the formulation components and process conditions, which is why they must be carefully incorporated into formulation development strategies.The findings of experiments and method development of optimised formulation to achieve 100% bioavailabiliy are rigorously analysed in this work.

A-357

DEVELOPMENT AND R- ASSISTED OPTIMISATION OF CURCUMIN NANOPARTICLES FOR THE IMPROVED OUTCOME IN PAEDIATRIC ROOT CANAL THERAPY

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Root canal treatment (RCT) is a dental procedure, carried out when the blood supplies, nerves, and connective tissue of the tooth pulp get damaged either by caries or by trauma. RCT may fail due to chronic infection caused by the bacteria Enterococcus faecalis (E.faecalis), resulting in post-RCT pain and infection in the tooth. To prevent this infection in children, dentists use anti-microbial fillers to fill the hole post-RCT. Calcium hydroxide (CH) is the most commonly used filler, but studies suggested that CH is not very effective against E.faecalis. This study is focused on improving the activities of CH by combining it with curcumin-loaded chitosan nanoparticles to formulate a novel filler. Preformulation studies were carried out for curcumin and excipients. Curcumin-excipient compatibility was determined using Fourier transform infrared (FTIR) spectroscopy. The nanoparticles were developed using the ionic gelation method and optimization studies were performed using R software. Particle size, percentage entrapment efficiency, and zeta potential were taken as the dependent variable and the amount of chitosan and lecithin were considered as the independent variable. Based on optimisation, the composition was reformulated and subjected to evaluation.

A-358

D-ALPHA TOCOPHEROL (TPGS) SURFACE SCAFFOLD POLYSARCOSINE BASED POLYMERIC NANOPARTICLES OF ENZALUTAMIDE FOR TREATMENT OF COLORECTAL CANCER: IN-VITRO, IN-VIVO CHARACTERIZATION

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The current research mainly depicts the formulation of Enzalutamide (ENZ) drug which is second generation Androgen receptor antagonist acting on testosterone binding which shows significant decrease in intensity of colorectal cancer loaded by PLGA (Poly Lactic co-glycolic acid) and Polysarcosine polymer with coating of Vitamin E d-tocopheryl poly ethylene glycol 1000 succinate (TPGS) on its outer surface. PSAR is used for good water solubility, low toxicity and non-immunogenic nature whereas TPGS is used to enhance the solubility of ENZ which is BCS Class-2 drug and induces apoptogenic action in cancerous cells. Optimization is carried out using factors like concentration of PLGA, Polysarcosine along with homogenization speed in Box-Behnken design yielding the results of particle size (196.9nm), Zeta potential (12.6mV) and entrapment efficiency (56.6%). DSC analysis show the entrapment of the drug. XRD analysis depict the crystallinity of the drug and the encapsulation of the drug in amorphous form of drug in formulation compared with Placebo. FT-IR results depict that there is no interaction between the drug and polymer in the drug formulation. The results of TEM show a perfect spherical shape of the nanoparticle at 200nm and FESEM results show proper coating of the polymeric nanoparticle. In-vitro anticancer studies like Mitochondrial Membrane Potential Estimation, Apoptosis analysis, cell cycle analysis, Reactive oxygen species estimation and IC50 evaluation with Sulforhodamine B assay depicting anti-cancerous activity of the drug formulation. Therefore, TPGS surface scaffolded polysarcosine based polymer nanoparticles of ENZ drug is proven to be beneficial for the treatment of colorectal cancer.

A-359

W/O PICKERING EMULSION OF CAPECITABINE SELF-STABILIZED BY POLYSARCOSINE NANOPARTICLES FOR THE TREATMENT OF SQUAMOUS CELL CARCINOMA

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A Pickering emulsion (w/o) was formed and self-stabilized by polysarcosine nanoparticles(PNPs) of capecitabine. Pickering emulsion (PE), a type of emulsion that is only stabilised by solid particles at the oil-water interface, is more stable against coalescence and has many beneficial properties. The objective behind research was to improve the efficacy, drug loading capacity and biocompatibility along with minimizing the toxicity and increase the stability of chemotherapeutic drug. Also to establish a suitable dermal kinetic profiling of the polysarcosine-based PE for the treatment of skin cancer(SCC). The PNPs were characterized using X-ray diffractometry, DSC, Particle size, Zeta potential , entrapment efficiency(E.E.) and SEM. The particle size, zeta potential and E.E. of PNPs was found to be 213 ± 50 nm, 20 ± 5mV and 65 ± 10%. Results showed that 40:60 w/o fraction is the most stable and can be stabilized by 2% PNPs. Also stability studies upto 60 days showed that there was no phase separation in 40:60 w/o fraction. To study the anti-cancer efficacy of formulation MTT-SRB Assay, Cellular apoptosis with flow cytometry, MMP Estimation, Cell cycle analysis , Reactive oxygen species estimation and in-vitro scratch assay was done. The MTT-SRB Assay demonstrated that Capecitabine loaded PNPs based PE can effectively inhibit the skin cancer cells growth to 17.88 %. The apoptotic and necrotic activity of PE was remarkably higher than free drug and control. PE induces late apoptosis and necrosis. Hence, our findings suggested that the Capecitabine loaded PNPs based PE could be a promising yet effective drug delivery system for the treatment of cutaneous-SCC.

A-361

FORMULATION AND EVALUATION OF CHITOSAN BASED ORAL NANOPARTICLES OF POORLY WATER SOLUBLE DRUG LURASIDONE

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The aim of the present study was to formulate and evaluate chitosan based oral nanoparticles of poorly water soluble drug, Lurasidone. The main objectives were to enhance the aqueous solubility of drug and to improve the rate of dissolution of drug .Lurasidone loaded chitosan nanoparticles were prepared by using modified inotropic gelation method by using chitosan as polymer ,acetic acid as solvent, tripolyphosphate (TPP) an anionic surfactant is used as cross linker and mannitol is used as cryoprotectant. Solid state characterization was done by FT-IR,TEM, DSC and XRD. SEM results showed nanoparticles were uniform in size and spherical in shape. Prepared nanoparticles were evaluated for particle size ,drug content, drug loading, entrapment efficiency, zeta potential, polydispersity index (PDI) and in-vitro dissolution study. Optimized batch of nanoparticles had acceptable particle size in the range of 222.2-348.5nm, Zeta potential (-13.3mV), PDI (1.000), drug content (35.06%), drug loading (82%), entrapment efficiency(85.32%) and in-vitro cumulative drug release of 84.37% in 1hr 30min. From these studies it was concluded that the ion gelation method is suitable for preparation of chitosan based Lurasidone nanoparticles. It was concluded that, development of chitosan based nanoparticles could be an effective strategy for enhancing the solubility and dissolution rate of Lurasidone.

A-362

FORMULATION AND EVALUATION OF MICELLAR GEL LOADED WITH AZITHROMYCIN

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Polymeric micelles are a promising tool for research in the field of drug delivery and drug targeting. Polymeric micelles are self-assembled nano-sized colloid particles made up of amphiphilic block copolymers. Due to their excellent biocompatibility, low toxicity, enhanced blood circulation time, and ability to solubilize large quantities of drugs in their micellar core the polymeric micelles have been widely used. Polymeric micelles in topical drug delivery to treat conditions like acne, eczema rashes sunburns, etc are gaining a highlight. Acne vulgaris is an inflammatory disorder triggered by Cutibacterium acnes. Asians and Africans tend to develop severe acne and mild acne is common in the white population. This work aimed to optimize polymeric nano-sized micellar carriers of the anti-acne compound azithromycin to treat skin conditionsi. e acne vulgaris. Azithromycin-loaded polymeric micelles composed of poloxamer 407 and Tween 80 were prepared by solvent evaporation method and characterized in terms of particle size, entrapment efficiency, and invitro drug release. Entrapment efficiency of the optimized batch was found to be 88%. And the drug release of the same batch was 67.90%. It concludes that the surfactants shows synergistic effect when used in appropriate ratios. Later on,the micellar solution obtained was converted to gel via Carbopol 934 and checked for gel parameters such as appearance, pH, drug content, and spread-ability. The results indicated that nano-sized polymeric micelles of azithromycin composed of Poloxamer 407 and Tween 80 offer a potential approach to treat skin conditions like acne vulgaris.

A-401

INCREASING THE SUSTAINABILITY OF ORAL DOSAGE FORM: AN APPROACH TOWARDS THE DEVELOPMENT OF MODIFIED RELEASE TABLET

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The Modified release dosage is a mechanism in which the drug is delivered to a specific target for a prolonged period of time. This type of dosage form involves lengthening the t half of the drug and hence increasing the bioavailability. These are developed by altering drug absorption or the site of drug release in order to achieve predetermined clinical objectives. Modified drug release dosage forms are complemented by the allied processes of drug design, dosage administration, membrane transport and absorption of drug to the biological site of action. The goal of developing Modified Release Formulations is to increase patient compliance; it enables patients with chronic diseases(diabetes, heart diseases, gastrointestinal disorders , Alzheimer's disease, Parkinson's disease, etc.) to take medicines less often with less fluctuation in the dosage form and hence increasing efficiency and also minimizing local and systemic side effects. Usually this is to slow the release of the drug and keep steadier levels of drug in the bloodstream for prolong periods of time. Delay-release (e.g., enteric-coated), extended-release (ER), targeted release, and oral dosing (ODT) are examples of MR drug products. Modified drug deliveries through oral route have proven to be of a great significance to prolong the effect of the active ingredient for sufficient time span in the body. These formulations are an aid of treatment to developing chronic diseases in the world and improving health of people around the globe.

A-402

DEVELOPMENT AND EVALUATION OF RITONAVIR NANOPARTICLE AGGLOMERATES AS DRY POWDER INHALER.

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In the recent times pulmonary drug delivery route is gaining much importance as it offers drug delivery to the lung both for local and systemic treatment. Dry powder inhaler (DPI) has several advantages both in terms of use and effectiveness over other pulmonary devices. The present study aims to develop and evaluate DPI formulation of an oral antiretroviral drug Ritonavir as nanoparticle agglomerates. Drug formulated into nanoparticle to enhance the drug solubility and lung deposition along with modified bio-distribution, in vivo stability, bioavailability and penetration through biological barriers. Nanosuspension was prepared using precipitation techniques. The prepared lyophilized Ritonavir nanosuspension was characterized and found that Ritonavir nanoparticle agglomerates can be effective in achieving high fine particle fraction for better lung deposition.

A-403

AMPLIFICATION OF AQUEOUS SOLUBILITY OF PROGESTERONE USING MELT-GRANULATION TECHNIQUE

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The purpose of the current research was to improve the bioavailability of progesterone through oral administration by boosting the hormone's water solubility. The goal of this study was to determine whether or not employing melt granulation techniques with a variety of polymers may improve the degree to which progesterone is soluble. When looking into the interactions between drug carriers and other substances, researchers turned to techniques such as X-ray diffraction, differential scanning calorimetry, SEM and Fourier transform infrared spectroscopy. PEG 6000 (1:1.5) demonstrated the highest solubility, followed by PEG 6000 (1:1) > Gelucire 50/13 (1:1.5) > Gelucire 50/13 (1:1). Increasing the aqueous solubility of the weakly soluble progesterone was demonstrated by these findings.

A-404

STABLE ANTIMALARIAL COMBINED FORMULATION DEVELOPMENT FOR BITTER-TASTING DRUGS

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Malaria remains one of the most serious infectious diseases; Globally, there were an estimated 229 million malaria cases in 2019 in 87 malaria endemic countries leading to hundreds of thousands of deaths, predominantly among children. Artemisinin-based combination therapies (ACT) are realized as main mechanisms of global malaria elimination programmes and have been shown to reduce transmission of this malarial species in zones with moderate and low endemicity. The present research studies aimed to develop combination therapy for the treatment of malaria. Dry powder mix formulation was developed which conceals bitter taste and overcomes stability of antimalarial drugs. Novel reconstituted oral liquid system shows the adequate chemical stability of the drug during shelf life, avoids physical instability related to solubility, pH and incompatibilities with other ingredients. Also, it reduces transportation expenses as it is in dry form.

A-405

DEVELOPMENT, OPTIMIZATION AND EVALUATION OF SELF NANOEMULSIFYING DRUG DELIVERY FOR POORLY SOLUBLE DRUG LEVOSULPIRIDE

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The bioavailability is dependent on solubility and permeability. The work is focused on the improvement in solubility and permeability of BCS class IV drug Levosulpride. The main objective of present invention was the development of Self nanoemulsifying Drug delivery for improvement in solubility and permeability. The drug solubility was estimated in selected oils, surfactants and co-surfactant. The pseudo ternary phase diagram was constructed by using Capryol 90, Maisine 35, LAS, Capmul PG 8, capmul MCM, Sefsol as individual or combination oil with tween 20, propylene glycol and Lutrol E400 as surfactant and cosurfactant respectively. The phase diagram helps to select the ideal proportion of oil and Smix ratio for the development of L-SMEDDS. The drug containing L-SMEDDS is developed as Capmul MCM (20 % w/w), Tween 20 (25 % w/w) and propylene glycol (25 % w/w) as oil, surfactant and co-surfactant respectively. The prepared L-SMEDDS is converted into solid-SMEDDS using adsorption to solid carrier. Aerosil 200 was used in 0.20 % w/w proportion. The prepared L-SNEDDS and S-SNEDDS was evaluated for drug content, % transmittance, globule size, zeta potential and in-vitro dissolution studies. The S-SNEDDS was characterized by FTIR, DSC, Particle size and zeta potential and % transmittance. The globule size and zeta potential of L-SNEDDS and S-SNEDDS formulation was found to be 180 nm with -24.00 mV and 528 nm with -31.6 mV respectively. The DSC, FTIR and powder XRD studies confirms the change in physical state from crystalline to amorphous state over plain levosulpiride. The invitro dissolution studies confirms the enhancement in dissolution rate of solide SNEDDS containing levosulpiride over plain levosulpiride. The developed formulation containing CApmul MCM, Tween 20 and Propylene glycol has the capability to improve solubility and bioavailability of levosupiride as a nanoemulsifying dosage form.

A-406

PAINLESS INSULIN DRUG DELIVERY SYSTEM

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For most patients with type 1 diabetes, the worst part of the disease is to tolerate needle after needle, both for glucose measurement and to deliver insulin. The pitfalls of needle-based injections are well known. Psychological resistances to self-injection or needle-phobia have been documented across large demographic groups, such as diabetics. The result of this phobia is that many outpatient injectable are dosed sub-optimally .to overcome the problems related to needle based injections, there is new insulin delivery systems that has received considerable attention during the past few years and that offers all of the sought after benefits is Needle Free Insulin Delivery. In this recap we discussed about their types, devices like jet injection, route of administration, how the system works and why we invent, and at last result and conclusion.

Bilayer oral thin films can prove a better option for pediatric population than the bilayer tablet as it gets dissolve in seconds and reduces frequent dosing. Levocetrizine dihydrochloride can be successfully taste masked using Polacrilin potassium for better patient compliance. Stability result showed that there is need to stabilize Montelukast sodium over extended period of time.

A-450

DEVELOPMENT AND CHARACTERIZATION OF NANOEMULSION BASED OPHTHALMIC DRUG DELIVERY SYSTEMS

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Nanoemulsions are promising delivery systems in ocular drug delivery due to their advantages such as enhanced ocular permeation,higher retention on ocular surface, better Bioavailability, safety and efficacy as compared to conventional coarse emulsion. In this current research, Nanoemulsion based Ophthalmic drug delivery system were developed with model drug using microfluidizer and were evaluated for Emulsion Droplet size, Polydispersity Index and Zeta Potential. Developed Nanoemulsions were found to have better control over the conventional emulsion. It can be concluded that Nano-Emulsion based drug delivery systems is more stable and promising in comparison with Rotor-stator homogenizers based conventional coarse emulsion systems, with the mean droplet size below 150nm.

A-451

SURFACE-ENGINEERED DENDRIMERS IN HIV MANAGEMENT

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Human Immunodeficiency Virus (HIV)-specific immune system damage in humans results in a group of symptoms and illnesses known as Acquired Immuno Deficiency Syndrome (AIDS). Surface-modified dendrimers have established a successful carrier for averting HIV infection. Lamivudine is a highly soluble, highly bioavailable, sufficiently long half-life drug that exhibits linear kinetics. Authentication of the drug was evaluated to set up its preformulation data before going further with formulation design with dendrimers. The spectroscopic studies (UV and FT-IR) based on the identification and standard curve preparation in various media were performed. Synthesized 5.0G poly (propyleneimine) dendrimer were conjugated with mannose, and characterized with different analytical methods such as ultraviolet, transmission microscopy, drug loading by a dialysis membrane, in-vitro drug release exhibited sustain release upto 48h., hemolytic toxicity parameters concerning the mannosylated dendrimer was evaluated. The developed dendrimer formulations were evaluated for hemolytic toxicity. The drug entrapment efficiency was confirmed to be 62.38 %. The anti-HIV activity of lamivudine-loaded MPPI dendrimers was established to hold elevated at a minimum concentration of 0.020 nM/mL, in contrast to that of free drug. Among them, 5.0G MPPI-3TC dendrimer formulations were proven as more effective antiretroviral agents. The anti-HIV potential of 5.0G mannosylated PPI dendritic drug conjugate systems was a delivery vehicle that can a sustained drug release for antiretroviral drugs and appears worth further exploitation.

A-452

A NOVEL STRATEGY FOR INFECTED WOUND USING ANTIABACTERIAL DRUG LOADED SILVER NANOPARTICLES CREAM

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Nanotechnology is an emerging field of modern research dealing with characterization of particle structures ranging from approximately 1-100 nm. Many metals have been used since ancient times in form of salt like silver as well as copper for antibacterial purpose, now changing trend in nanotechnology helps in making metal in nanosize. Nanoparticles (NPs) have wide range of applications in areas such as health care, cosmetics, chemical industries and medicinal purpose. Silver nanoparticles have major option in treatment of wounds.Wound is damage to the integrity of biological tissue, including skin, mucous membranes, and organ tissues. Wounds are cleaned and appropriately dressed to limit the spread of infection and further injury. The aim of the research study is to prepare antibacterial drug loaded silver Nanoparticles cream and evaluate it for infected wound. Silver nanoparticles were prepared by chemical reduction method in which AgNO3 was use as precursor andtri-sodium citrate as reducing agent. Then prepare nanoparticles was evaluated in which particle size, FTIR, SEM, XRD and antibacterial activity was studied. Average particles size was observed in the range of 1-100 nm other parameter also shows the result in the standard limits. The cream was prepared and evaluated the parameter like Spreadability, viscosity, and pH. Theln-vitro antibacterial activity of prepared silver nanoparticles cream was checked against bacterial cultures of E, coli. The wound healing activity was also checked against Wistar rat. Theresult shows that silver nanoparticles prove its significant antibacterial activity and novel strategy was effective for the treatment of infected wounds.

A-453

HERBAL EXTRACT FLOATING TABLETS FOR GASTRIC ULCER MANAGEMENT

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A floating drug delivery system (FDDS) of the herbal extract was developed and tested for its ability to remain in the stomach for an extended period. The purpose of this was to provide antibacterial and proton pump-inhibiting effects. The prepared dosage form was evaluated using chromatographic analysis, floating lag time, total floating time, drug release, and in vitro antibacterial activity. The results showed that the formulation contained all expected chromatographic bands and had a floating lag time of less than one minute, with a total floating duration of over 12 hours. It also released up to 90% of both extracts and showed minimum inhibitory concentrations of 40 mg and 100 mg in in-vitro studies. The formulation retained 0.1 N hydrochloric acid for over 12 hours and had a drug release of up to 90%, making it potentially beneficial for treating gastric ulcers.

A-454

GUAR GUM BASED ONDANSETRON MICROSPHERES FOR IRRITABLE BOWEL SYNDROME

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Ondansetron is a selective serotonin 5-HT3 receptor antagonist that is regularly used for the prevention of vomiting. It is also prescribed for treatment of IBS (Irritable Bowel Syndrome) which has half-life 3-5 h and bioavailability ~ 60%. The objective behind the research was to formulate guar gum based Ondansetron microspheres for colon specific target delivery in the treatment of Irritable Bowel Syndrome. Ondansetron microspheres were prepared by modified method of emulsification crosslinking and emulsion solvent evaporation method. The prepared microspheres were evaluated for encapsulation efficiency, loading capacity, percentage yield and particle size and it was found that it has anentrapment efficiency 74.8 % (w/w), loading capacity 51.28% (w/w), percentage yield 32.5% (w/w) and particle size of 0.1μm - 0.2 μm. After optimization enteric coating was done for colon specific drug delivery. An attempt was made to prepare guar gum based microspheres of Ondansetron which by enteric coating prove as an effective strategy for the treatment of Irritable Bowel Syndrome.

A-455

DESIGN, FABRICATION, IN VITRO&IN VIVO EVALUATION OF ULTRADEFORMABLE VESICLES LOADED GEL TREATMENT OF VAGINAL CANDIDIASIS

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Ultradeformable vesicles are spherical vesicular drug delivery systems, also termed as ultra-deformable elastic liposomes, to combat disadvantages associated with liposomal drug delivery system via enhancing the bioavailability of drug, providing adequate permeation, better therapeutic efficacy, having excellent biocompatibility, and structural versatilities and high stabilityand an apt choice of carrier system to combat the pharmaceutical nuances inflicted by Nystatin. Nystatin ultradeformable vesicles were prepared by modified hand shaking method by employing seven surfactants in three different rations and turbidity a maximum vesicles per cubic millimeter, loading efficiency , drug pay load,-Zeta potential, PSD , PDI optimized. Vaginal permeation studies parameters were found to be 0.44h of lag time, 0.372 mg/h/cm^{2}of flux and 0.124h/cm^2 of permeability coefficient when compared to Lag Time (0.096h) 0.099 flux and 0.03 permeability coefficient of pure drug. Degree of Deformability was obtained to be 42.5 indicating high flexibility of the transferosomes to squeeze through the pores of the membranes of lower diameters.The DSC thermograms of pure drug and freeze dried NYS-CELb exhibited endothermic peaks at 161.970C and 161.50C indicating absence of drug interaction.. The SEM&TEM images of NYS-CELb were in agreement with PSD and PDI data.The SAXS also confirmed the formation of unilamellar spherical vesicles. Animals NYSCELb gel and Standard Drug, respectively, exhibited an absence of Candida, either as

A-496

DESIGN & DEVELOPMENT OF CURCUMIN LOADED ZINC OXIDE NANOPARTICLES DECORATED MESOPOROUS SILICA AS A TISSUE GLUE

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The present research directs towards synthesis and characterization of curcumin loaded zinc oxide nanoparticles decorated mesoporous silica as a tissue adhesive. The mesoporous silica nanoparticles complex facilitates the tissue adhesion based on the phenomenon of Nanobridging effect. The Curcumin add on the antibacterial effect to this novel tissue glue while Zinc oxide Nanoparticles enhance the Bonding strength between two tissues. The mesoporous Silica was synthesized by sol gel methodology while the drug was incorporated by wetness impregnation method. The prepared platform was characterized by Infrared spectroscopy, TEM, DSC, XRD, Particle size, Mercury porosimetry, Tissue model adhesion test, antimicrobial assay, Antioxidant activity by DPPH assay and wound model in Sprague Dawley rats. The average particle size was found to be less than 100 nm. The Tissue model adhesion graphs showed significant change in bonding strength of Mesoporous silica nanoparticles, cur-ZnO-MSN and the carrier media that is water. The wound was glued by the Mesoporous Silica based tissue glue in 30 seconds while completely healed in 5 days as compared to the suture positive control which took nine days. Morever, the zone of inhibition in Agar well method of Antibacterial assay against the skin infecting pathogens like S.Aureus & P.Aeruginosa suggested an effective anibacterial property.

A-497

FORMULATION AND OPTIMIZATION OF LIQUISOLID COMPACT BASED VAGINAL SUSTAINED RELEASE TABLET OF LAWSONE FOR VAGINAL CANDIDIASIS

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Antifungal therapy is causing an alarming drug resistance problem during the treatment of Vaginal Candidiasis and also many of the antifungal vaginal marketed formulation have reported major side-effect of the irritation. Hence the quest for natural therapy is currently booming. Lawsone is having poor aqueous solubility and its antifungal activity is therefore hindered. Hence, the present research work aimed to formulate the liquisolid compact based vaginal tablet of Lawsone to improve its solubility and dissolution rate. The tablet was optimized by 32 full factorial design. The independent factors selected were carrier (Neusilin US2): coating material (Aerosil 200) ratio (R) and concentration of the mucoadhesive polymer (HPMC K4M) while the dependent factors studied were in vitro release (6 h and 12 h) and mucoadhesive strength. The drug was dispersed in non volatile solvent polyethylene glycol 400 to prepare the liquid medicament that was further used for liquisolid compact. The FTIR, DSC and XRD studies revealed no incompatibility between Lawsone and the excipients of the tablet and suggested that the drug was dispersed completely into the liquid medication and therefore transformed from crystalline to amorphous state. In vitro release study suggested sustained release with enhanced dissolution of optimized liquisolid compact tablet LT7 (94.92%) than the plain tablet (61.16%). The in vitro antifungal activity against C. albicans, C. glabrata and C. krusei for liquisolid tablet and the marketed tablet formulation showed insignificant difference.

A-498

PELLETIZATION A NOVEL METHOD FOR AN ORAL CONTROLLED RELEASE FORMULATION – A REVIEW

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Pellets are microscopic, quickly moving, spherical (0.5 to 2 mm), agglomerated granules or powders of bulk medicines and excipients. Pelletization is the term for the aggregation of fine powder or granules. Pellets provide development of formulation with high degree of flexibility due to free- flowing characteristic Pellets as a drug delivery System offer not only therapeutic advantages such as less irritation of the gastro-intestinal tract and a lowered risk of side effects due to dose dumping. Pellets can be prepared by many methods, the compaction and drug-layering techniques being the most widely used today. Immediate drug delivery is suitable for drug substances with different categories having poor solubility. Today pelletization represents an efficient pathway for novel drug delivery in the scope for development of different modified-release solid oral dosage forms. Consequently, potential side effects can be minimized without impairing drug bioavailability. Pelletization technique produces more spherical pellets and offers more advantages than granulation process.

A-499

PRONIOSOMES – A PROMISING NANO DRUG DELIVERY SYSTEM

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Proniosomes are water-soluble carrier particles in a dry formulation that have a surfactant coating. On agitation in hot aqueous solution, they are rehydrated to form niosomal dispersion right before application in a matter of minutes. The nonionic bilayer structure of proniosomes has a hydrophobic outside and a hydrophilic inside. They do not experience the issues brought on by either the aqueous noisome dispersion or the aggregation, fusion, and leakage issues. Proniosomes not only present a promising medication delivery method but also have the potential to speed up skin barrier healing. Various parameters, comprising vesicle size, size distribution, zeta potential, shape, correlations between the drug and other formulation contents, entrapment efficacy, and drug content, are used in the physicochemical characterisation of proniosomes. The results of the research done so far on proniosomes pave the way for the potential use of various carrier materials in the future that are biocompatible and appropriate for proniosome synthesis.

A-501

FORMULATION AND EVALUATION OF SUSTAINED RELEASE COMBINATION TABLETS USING COMPRITOL 888 ATO

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Recent developments in sustained release drug delivery systems (SRDDS) aim to improve patient compliance while improving the safety and efficacy of the drug molecule by developing a convenient dose form. In the current research, tablet was formulated with immediate release granules of pioglitazone and sustained release granules of caffeine. Sustained release granules for tablet were prepared using Compritol 888 ATO polymer in ratio with PVP that retard the release of drug from tablet and for improvement of patient compliance. The sustained release tablets were prepared by wet granulation method. The formulated tablet was subjected to tests like thickness, friability, weight variation, hardness, drug content, in-vitro release study, and stability study. Drug and polymer compatibility study was performed by FTIR. Out of 12 batches prepared the optimized batch is selected based on the concentration of Compritol 888 ATO with PVP is increased it showed better drug release as Compritol 888 ATO is release retardant. The in-vitro drug release was found to be more than 90% after 12 hours. This release retardant (Compritol 888 ATO) at the optimized concentration formed a desired matrix with the PVP it showed and action with the combination of pioglitazone and caffeine proved to be a promising approach antidiabetic action.

A-502

FORMULATION AND CHARECTERIZATION OF RALOXIFINE - IN -LIPOSOMAL PATCH AND GEL FOR TRANSDERMAL DELIVERY

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Liposomes, one of the essential novel drug delivery vehicles, are incredibly flexible and may be utilized to carry a wide range of medicinal chemicals. Raloxifene hydrochloride is a Selective estrogen receptor modulator which is used in treatment and prevention of postmenopausal osteoporosis. Raloxifene hydrochloride has a poor oral bioavailability, so the main goal of the study was to formulate liposomes containing it using various lipid and cholesterol ratios and sonication times, as well as to incorporate the finished liposomes into transdermal patches and gel to achieve a prolonged release of the medication when applied topically. The liposomal formulations were prepared by thin film hydration method and characterized for drug encapsulation, vesicle size, in-vitro drug release and stability using specific methods. The particle size of the liposomes was reduced with increased sonication time. The optimized liposomal formulation was made and it contained egg lecithin: cholesterol in a 60:40 ratio that was sonicated for 20 minutes. This formulation had a 65.31% entrapment efficiency and 59.51% drug release. The enhanced formulation was created as a gel and patch, and it was evaluated and compared to non-liposomal formulations. The formulated liposomal and non-liposomal gel was evaluated for pH, viscosity, spreadability and in-vitro drug release study. The formulated liposomal and non-liposomal patch was evaluated for folding endurance, % moisture absorption, % moisture release, thickness, water vapour transmission rate and in-

found that in this investigation, the microspheres released Rosiglitazone Maleate at different rates depending on the polymer used to make them. Up to a 12-hour medication release was seen with F1 and F2 formulations. Most consistently, F1's carbopol 934 and sodium carboxymethyl cellulose had the greatest mucoadhesive profile and acceptable surface morphology of the many formulations tested. Researchers found that formulation F1 microspheres were the best option for delivering Rosiglitazone Maleate into the gastrointestinal system for an extended period.

A-720

FORMULATION AND EVALUATION OF FLOATING GASTRORETENTIVE TABLET OF AMLODIPINE BESYLATE

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The aim of this research work was to develop a novel gastroretentive floating tablet of Amlodipine Besylate. Amlodipine Besylate has a maximum solubility in acidic pH & shows maximum absorption in stomach so an attempt has been made to sustain the drug release by incorporation of hydrophilic swellable polymers, to retain the drug in stomach floating polymer was used. The tablets were designed, after oral administration to provide desired, controlled and complete release of drug for prolonged period of time in treatment of hypertension. Floating Tablets of Amlodipine Besylate were formulated using various materials HPMC, PVP, Xanthum gum, Sodium Bicarbonate, etc. The floating tablets were evaluated for physical characterization, buoyancy study and in vitro release of drugs. The result indicated that the floating formulation F 5) showed 97% release in 8 hrs while the buoyancy lag time was 2 mins and remained buoyant above 15 hrs.

A-721

NUTRACEUTICALS: LIFESTYLE THERAPY

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In the current scenario people are deeply concerned about their health because of lifestyles have changed due to increase in working hours and various psychologicapressures, which have led to an increased incidence of various life-threatening diseasesl "Hippocrates said "let food be your medicine and medicine be your food, to predict the relation between food for health and their scientific therapeutic benefits". Different types of nutraceuticals are functional food, medical food, dietary supplements, dietary fibers, prebiotics, and probiotics. Nutraceuticals provide multiple health benefits ranging from general well-being to treatment of chronic disease.Health benefits of nutraceuticals are due to their diverse chemical composition, which includes fatty acids, proteins, carbohydrates, phenolics, polyphenols, alkaloids, terpenoids, and polyols. Being of natural origin, nutraceuticals are considered as safe for human consumption. Apart from disease prevention, they play an important role in disease management and therapy. Also, the growing consumer awareness regarding health care has led to the tantalizing opportunity for a "nutraceutical" breakthough in the pharmaceutical battleground as an alternative to modern medicine

A-722

"DEVELOPMENT AND CHARACTERIZATION OF METRONIDAZOLE LOADED NANO-EMULSION USING TEA TREE OIL FOR VAGINAL CANDIDIASIS"

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Vulvovaginal candidiasis is a vaginal infection caused by the fungal pathogen Candida albicans that, most commonly, affects women of reproductive age. The major symptoms of VC are dyspareunia, pruritis, itching, soreness, vagina as well as vulvar erythema and edema. Most common risk factors that lead to the imbalance in the vaginal micro biota are the use of antibiotics, pregnancy, diabetes mellitus, immune-suppression as in AIDS or HIV patients, frequent sexual intercourse, spermicide and intra-uterine devices and vaginal douching. During a lifetime, greater than 50% of women aged 25 years and over, have suffered from VVC at some time, fewer than 5% of these women experience recurrences. Metronidazole the most widely known and used member of the nitroimidazole drug class. It is frequently used to treat vaginal infections. Metronidazole diffuses into the organism, inhibits protein synthesis by interacting with DNA, and causes a loss of helical DNA structure and strand breakage. Therefore, it causes cell death in susceptible organisms. Metronidazole has low bioavailability in vaginal route of administration. It has low lipid solubility that probably contributes to poor vaginal absorpti The aim of the investigation is to develop metronidazole loaded nano-emulsion based gel us tea tree oil to ensure enriched and extended therapeutic effectiveness against vagi candidiasis and improves permeability and have advantages of increased drug loading a enhanced bioavailability.

A-723

EVALUATION OF CUTINA® HR AS A CARRIER FOR SOLID LIPID NANOPARTICLES BY EMPLOYING POORLY WATER-SOLUBLE DRUG QUETIAPINE FUMARATE AS A MODEL DRUG

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The aim of the present study is to evaluate the use of Cutina® HR as a carrier and SLNs as carrier system by employing Quetiapine fumarate as a model drug. Quetiapine Fumarate is antipsychotic drug used in the treatment of Schizophrenia. Quetiapine Fumarate has po water solubility and oral bioavailability of 9% due to first pass metabolism. The attempt w made to prepare poorly water-soluble drug into Solid lipid nanoparticles as a carrier system a Cutina® HR as a carrier which has ability to improve the solubility and enhance the o bioavailability. Quetiapine Fumarate loaded SLNs were prepared by two different techniqu i.e. Hot Homogenization and Quenching. The Cutina ® HR was used as the lipid carrier, Geluci 50/13 as lipophilc surfactant and Kholliphor P 188 as Hydrophilic surfactant in the preparatio Prepared formulations of SLNs were subjected for various evaluation parameters li entrapment efficiency, In Vitro drug release, Particle size, Zeta potential and Stability studie The study conclusively demonstrated that the solubility of drug was improved by entrappi the drug into solid lipid carrier which led to prolongation of drug release by the Cutina® HR as lipid carrier and SLN carrier system.

A-724

DESIGN AND DEVELOPMENT OF NANOPARTICLES LOADED IN-SITU GEL FOR ENHANCED AND SUSTAINED OPHTHALMIC DELIVERY

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The objective of the present investigation was to develop in-situ gelling ocular formulation o Flurbiprofen nanosuspension to improve the solubility and to enhance drug contact time wit the ocular surface and to improve overall bioavailability. Flurbiprofen BCS class II drug whic has poor solubility and limitations such as drug loss through lacrimation, nasolachryma drainage giving an overall bioavailability of less than 5%. These complications can be overcom by preparing a nanosuspension and developing in-situ gelling system to increase the contac time of drug with the corneal surface. Antisolvent precipitation- ultrasonication method wa adopted for the preparation of flurbiprofen nanosuspension which was further incorporate into the in-situ gelling polymer matrix. The nanosuspensions were prepared with a stabilize poloxamer 407. These were evaluated for particle size, zeta potential and PDI. The nanosuspension with least particle size and PDI was chosen for incorporation in gelling matrix The optimized nanosuspension prepared showed good particle size of 191.2nm, zeta potential of 0.0998 and PDI of 0.618. The optimized nanosuspension was incorporated into in-situ gelling base. The optimized formulation was broadly characterized for various physical parameters like in-situ gelation, rheological properties and invitro drug release, TEM, DSC studies. In conclusion, nanosuspension loaded in-situ gel is a promising approach for delivery of drugs via ocular route in order to increase drug permeation through cornea and thus improving overall drug bioavailability.

A-725

GREEN NANOTECHNOLOGY: A DAWN IN SUSTAINABILITY

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Amidst the increasing technology and science, we humans are moving towards the future and the most unrealistic technology. This advancement has not only accelerated the growth of humans but has also mistreated earth and the environment in its own way. To find ways to cope with this situation and to amplify sustainability, nanotechnology has designed a better sustainable way called green nanotechnology. Green technology is related to the utilization of engineering merchandise and producing processes. inexperienced nanotechnology encourages substitution of existing products so as to develop new nano-products. Production of recent nano-products makes the setting friendlier. It's accustomed to heighten the environment

most optimized coformer. Ultrasonication technique was found to be successful in yielding solid cocrystalline compound in stoichiometric ratio 1:2. Fourier Transform infrared spectroscopy showed alterations in spectral bands, confirming the creation of hydrogen bonds between Mesalamine and coformer Ascorbic acid. The changes in crystallinity in the cocrystal and the interaction between the drug and coformer were confirmed by Differential scanning calorimetry studies. The appearance of new peaks at various 2θ values for cocrystals produced by ultrasonication method for coformer confirmed that a new crystalline phase had formed. Cocrystallization of Mesalamine was found to be successful in enhancing dissolution rate by 11% and solubility.

A-515

EFFECT OF BLENDING PROCESS PARAMETERS AND POLYMERS ON STABILITY OF TABLETS

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Aim and Objective: In this study, different concentrations were screened and cellulose polymers to evaluate the stability of developed Camylofin Hydrochloride tablets.
Methodology: Different grades of Hydroxy Propyl Methyl Cellulose were used to evaluate the stability of a drug. HPMC polymers were selected based on the properties of polymer grades to retard absorption of moisture onto the hygroscopic drug. Direct compression method was used to formulate the oral solid dosage forms. Result and discussion: The blend were subjected to blending at constant RPM. The prepared blend was subjected to precompression parameters have been examined for flow properties. Further, the final grade of cellulose polymer was selected and evaluated for morphology and X-ray diffractometer to check the uniform film formed and any polymorph present after keeping the tablets for stability.
Conclusion: The present study revealed that the HPMC E3 was the most suitable polymer to maintain stability.

A-516

FORMULATION DEVELOPMENT, OPTIMIZATION, AND CHARACTERIZATION OF ANTI-FUNGAL TOPICAL BIOPOLYMERIC FILM USING A NIOSOMAL APPROACH

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Background: Griseofulvin is an antifungal drug that is currently available in the market only in oral dosage forms. So, the development of topical treatment could be advantageous for the treatment of superficial fungal infections. Though for superficial fungal treatment, the skin acts as a major target as well as a principal barrier for drug delivery. To overcome this the colloidal carrier system noisome was used. Niosomes being in the nanometer size range would allow the delivery of the drug at the desired site. Niosomes being non-ionic surfactant-based vehicles would facilitate the passage of the drugs through as skin is composed of both lipid and aqua, which would create problems for any other delivery system. Methodology: Griseofulvin belonging to the BCS Class II was formulated in the form of niosomes to enhance the drug's solubility. In this study, optimization of niosomal formulation was done using OVAT (one variable at a time) method. Here, the CMAs (critical material attributes) such as surfactant type, conc. of charge inducer and the ratio of surfactant: cholesterol and CPPs (critical processing parameters) such as rotational speed of evaporator flask, external phase temperature, hydration time, and external phase volume (both aqueous and organic), which are independent variables as influencing factors at different levels. These are said to have a potential risk on the CQAs (critical quality attributes), which are dependent variables, such as vesicle size, vesicle shape, vesicle lamellarity, niosome aggregation, polydispersity index, and drug entrapment efficiency, for final selection of improved optimum batch. The films were prepared from the incorporation of griseofulvin-loaded optimized niosomes in chitosan film for topical drug delivery in superficial fungal infections. Characterization: The films' properties were characterized by physical appearance, film thickness, weight variation, folding endurance, tensile strength, moisture, uptake, moisture content, drug content uniformity, In-vitro drug diffusion studies, ex-vivo studies, and antifungal efficacy against Candida albicans. Result and Discussion: Thus, chitosan film formulation integrating griseofulvin-loaded niosomes for topical delivery enhanced the permeability of the drug and avoided the side effects associated with the orally-administered marketed formulation. Conclusion: Biopolymer chitosan exhibited antifungal activity implying enhanced drug efficacy. Therefore, two concepts of using optimized vesicular carrier systems and biopolymeric films have been combined and this topical novel composite film having the potential for griseofulvin delivery to superficial fungal infections has been formulated.

A-517

DEVELOPMENT OF LEAK TEST APPARATUS

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Leak test apparatus is a instrument designed for leakage testing of food drug and other industrial chemical, specially pharmaceutical products. The instrument is equipped with a micro controller based on 4 digit seven segment bright red led displays. Leak tester works on the principle of creating a negative pressure in closed chamber which inflates the leaked pouches due to pressure and leaked pouches don't inflate. The unit contains polycarbonate desiccator housing to sustain vacuum for long time. A compact vacuum pump for creating the vacuum label in short time period is used. Vacuum gauge on the front panel of the instrument indicates the vacuum level. The vacuum gauge is connected to control valve that regulates the vacuum inside the desiccator from the vacuum source. Test samples to be analyze placed into polycarbonate desiccator a vacuum pump generate a vacuum inside the desiccator. The vacuum generator is held for a preset time and then released manually. The test sample to be analyzed should retain their shape during this stage indicating the sealing is correct. Samples such as the strip or bottle under test are immersed in a coloured dye solution (normally methylene blue). The venting of the desiccator will allow any holes to be penetrated by the dye and the contents of the flexible packaging also be stained with same coloring material. The instrument is used to test the quality of packing processes in strips, blisters and sachets containing tablets and also used for granules and liquids.

A-518

COMPLEXATION BASED NANOCARRIER IMPREGNATED ANTIINFECTIVE TEXTILE

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The antimicrobial, especially the antibacterial, activity of nanoparticles is gaining much significance in inhibiting bacterial growth on the fabric surface which can be utilized to arrest the spread of pathogenic bacteria and to protect the cloth from bacterial-mediated damages.The objective of the research was to develop antibacterial textile loaded with nano drug nanocarrier system consisting of nanoparticles made up of chitosan and cyclodextrin.The nanosystem simultaneously utilizes the cyclodextrin drug complexation power and inherent properties of chitosan nanoparticles. Curcumin was selected as a model drug because of its low aqueous solubility and antimicrobial activity.The curcumin cyclodextrin inclusion complex were prepared by using kneading, solvent evaporation and freeze drying method.The inclusion complex prepared by freeze drying method exhibited highest aqueous solubility and in vitro release in water within five minutes. Furthermore, the inclusion complex prepared by the freeze-drying method was loaded in chitosan nanoparticles.The curcumin loaded and curcumin cyclodextrin inclusion complex loaded chitosan nanoparticles was prepared by ionic gelation method. The resulting nanosystems were thoroughly characterized for their particle size,zeta potential,entrapment efficiency and for antimicrobial properties.The complexation of the drug with the cyclodextrin facilitated their entrapment into the nanoparticles. The curcumin cyclodextrin complex loaded nanoparticles resulted in higher entrapment efficiency,lower particle size and increased antibacterial properties than curcumin chitosan nanoparticles. The curcumin cyclodextrin inclusion complex loaded chitosan nanoparticles were impregnated in textile using pad dry cure method. The antibacterial activity of the fabrics was assessed using standard AATCC 147 method.The nanoparticles loaded textile was found to exhibit antibacterial property.

A-519

FORMULATION AND EVALUATION OF ORODISPERSIBLE TABLET OF AMLODIPINE-BESYLATE

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The main purpose of fast dissolving tablet that are being formulated is to provide fast disintegration and Rapid absorption to ameliorate in vitro drug release time. Objective of the experiment Asian work was to design a fast dissolving Amlodipine Besylate tablet that regulates the systemic blood pressure to treat condition like hypertension. Rapid mouth dissolving tablets dissolves with disintegration time less than a minute, without need of water. 9 different formulation was designed by using Hibiscus Rosa sinensis mucilage, MCC and their amalgamation. From various combinations, the 9th number which was prepared from the

standard field in computing because it has increased the human life in several areas. AI has recently surpassed human performance in many domains, and there's nice hope that in tending. AI might leave higher bar, detection, diagnosis, and treatment of malady. Major malady areas that use AI tool embody cancer, neurology, medicine and polygenic disorder. Review contains the present standing of AI applications in tending. AI can even be accustomed mechanically spot issues and threats to patient safety, like patterns of sub-optimal care or outbreaks of hospital-acquired malady with high accuracy and speed. a number of in progress researches of AI applications in tending that give a read of a future wherever supply is a lot of unified, human experiences. This review also will explore, however AI and machine learning will save lives by serving to individual patient's moral problems within the application of AI to tending also are mentioned.

A-584

DEVELOPMENT OF NOVEL DOSAGE FORM FOR CONTACTLESS DELIVERY OF DENTAL DRUG

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Gingivitis is an inflammatory gum disease characterized by irritation, reddening, of the gingiva which if left untreated, results in periodontitis followed by tooth loss. Gingivitis and Periodontitis are the most common dental diseases usually characterized by dental pain. The aim of the present study was to develop and evaluate a dental spray as a formulation for contactless delivery of drug. Diclofenac sodium was used as a model drug having anti-inflammatory and analgesic property. The formulation was developed using Poloxamer 407 as pH sensitive polymer in combination with HPMC K100M as viscosity modifying polymer. Menthol and methyl paraben were added as a cooling agent and preservative respectively. A mixture of Ethanol and Distilled Water in a fixed ratio was used as a solvent system. The formulation was developed by using cold method. The solvent system of developed formulations were evaluated for various pharmaceutical parameters. The developed formulations were evaluated for pH, viscosity, drug content, spray pattern, average weight per dose. The gel system was subjected to gelling time, gelation temperature, viscosity and in vitro drug diffusion studies. The formulation F5 containing 10% of Poloxamer 407 showed acceptable gelation temperature with minimum gelling time and exhibited linear in vitro diffusion of durg for period of 180 minutes. Thus F5 was considered as best fit formulation.

A-585

HYDROGEL AND ITS USES IN THE OPTHALMIC DRUG DELIVERY

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Hydrogel is the biomaterial which absorb large quantity of water and this parameter alter the drug release profile of the drug i.e. it provides the sustain release profile. Hydrogel are the polymer which induce the liquid-gel transition. Due to the hydrophilicity, hydrogel can imbibe large amounts of water. Therefore, release mechanism from hydrogel are different from hydrophobic polymer. Temperature sensitive hydrogel are able to swell or deswell as a result of changing in the temperature of surrounding fluid. In case of pH sensitive hydrogel, the pH-sensitive polymer contains acidic or basic group that can accept or donate protons with respect to change in pH of the surrounding. Generally, it is seen that swelling of hydrogel increases if the polymer contains weakly acidic group, but decreases if polymer contain weakly basic group. In the present situation, major consideration during the formulation of hydrogel-based drug products are their mechanical strength and response time in a physiological environment. Fast-responding hydrogel release maximal drug in less time while maintaining the structural integrity in a biological system will be the more appreciated delivery systems. The major disadvantage of hydrogel is that it results in blurred vision.

A-588

TOPICAL POLYMERIC NANOPARTICLES FOR SYNERGISTIC ANTIBACTERIAL EFFECT

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Skin infections are common and one can easily acquire it from direct or indirect contact with contaminated surfaces. Amongst the skin diseases, bacterial skin infections which includes Impetigo, Folliculitis, Cellulitis and Erysipelas account for greater proportion. Despite the profound impact of bacterial skin diseases, there appears to be a lack of commensurate attention globally. Bacterial infections are often treated with topical antibiotics applied directly to the skin or with oral antibiotics. Clindamycin phosphate an Antibacterial drug shows promising results in treatment of skin infections. Although it is inactive in vitro, but rapid in vivo hydrolysis which converts the compound to the active clindamycin maintaining antibacterial activity. The work focuses on development and evaluation of clindamycin phosphate nanoparticles for topical delivery for anti bacterial activity. The nanoparticles were prepared by ionic gelation method. Chitosan, naturally available polymer was used in formulating the nanoparticles and adding chitosan will enhance and will show synergistic antibacterial activity. The rationale was to incorporate drug into nanoparticles and maximize the amount of contact time with the skin surface by delaying the release from nanoparticles of the drug. The sustained release also minimizes the transdermal penetration of the drug. The formulation was further compared with marketed gel clinoitop. It was observed that Clindamycin phosphate showed control release of drug from nanoparticles, zone of inhibition of formulated gel against microbes were greater than marketed gel. Stability testing of nanoparticles and gel were performed as per ICH Q1 guidelines for a period of 3 months.

A-589

FORMULATION AND EVALUATION OF SUSTAINED RELEASE TABLETS OF METFORMIN HCL BY USING NATURAL POLYMER.

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Yashwantraw Bhonsale College of Pharmacy Sawantwadi

Metformin HCL, the only available biguanide, remains the first line drug therapy for patient with type 2 diabetes mellitus acts by decreasing hepatic glucose output and peripheral insulin resistance. It has relatively short plasma half-life, low absolute bioavailability. The overall objective of the present work was to develop an oral sustained release metformin HCL tablet prepared by direct compression method, using HPMC and karaya gum as natural polymer. The formulated powder blend was evaluated for bulk density, tapped density, compressibility index & angle of repose. The formulated tablets were evaluated for physical characteristics of sustained release tablet such as thickness, hardness, friability, weight variation, & drug content. The results of the formulation found to be within the limits specified in official book. The results were evaluated for 12 hr. As per the results of dissolution study for the formulations f1, f2, f3, f4, f5, f6, f7, f8, f9.The % of drug release was found to be 96.4%, 88.1%, 92.4%, 79.3%, 78.4%, 94.1, 99.8, 82.5%, 86.6% respectively release over a period of 12 hr. Among all the formulation, f7 shows 99.8% of sustained drug release and tablet was retained at the end of 12 hr. It was found that the cumulative % of drug release decreases with increase in the polymer concentration and cumulative % of drug release increase with increase in filler concentration. Marketed formulation glycomet SR showed 90.2% at 12h.

A-590

SELF NANOEMULSIFYING DRUG DELIVERY SYSTEM: AN INTRIGUING TRANSPORTER FOR POORLY WATER SOLUBLE DRUGS.

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Drug absorption and solubility have been recognized as significant problems in oral drug delivery systems. More than 40% of the new drugs discovered have either low or no solubility in aqueous media, which in turn causes low bioavailability. To overcome this problem, new tools have been employed. However, specific criteria were not met as expected, leading to the formation of a lipid-based drug delivery system. Among various lipid-based drug delivery systems, self-nano-emulsifying drug delivery systems [SNEDDS] have shown favorable outcomes in numerous studies as an effective method for increasing the bioavailability and dissolution rate. The spontaneous emulsification and production of nanoemulsion in aqueous media, the small globular size, and the increased entrapment efficiency of SNEDDS allow them to deliver a relatively high dose of the drug. On the basis of latest research it was found that the SNEDDs of BCS class 2 drug omeprazole have dissolution rate of 55.00 ± 3.07mg% in 0.2M phosphate buffer, whereas in case of omeprazole tablets it was found to be 13.49 ± 5.08mg%. Similarly, the bioavailability of SNEDDS of Rosuvastatin was 2.45 times greater than that of Rosuvastatin suspension. Different researches strongly suggests that SNEDDS constitutes a potential soluble drug nano-carrier that still needs to be explored.

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AYURVEDIC REMEDIES FOR THE DISEASES OF MICROBIAL ORIGIN

Dr. Shreerang V. Joshi
Dr. Rajasekhar Reddy Poonuru
Dr. Shriram Bairagi,
Dr. Dhanashri Revannath Mali,
Mr. Shubham J. Khairnar

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PREFACE

This book is a result of extensive literature survey done by students of pharmacy, and other science fraternity from different colleges all over India. The information in this book is not intended to be a substitute for professional medical advice. Do not use this information to diagnose any disease of bacterial/viral/fungal origin also the book should not be used for ayurvedic treatment of any disease of bacterial/viral/fungal origin. However, the book is published to serve as a guide for people wishing to do research on our indigenous plants which can be used in the treatment of diseases of bacterial/viral/fungal origin.

We are thankful to all the contributors as without their help publishing this book would have not been possible. We wish all our readers knowledgeable and research-oriented reading.

1C-100

MICROSPONGES: AS A DRUG DELIVERY SYSTEM

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ABSTRACT

Microsponges are particulate drug delivery system composed of porous nature. They are small tiny sponges like spherical particles with large porous surface moreover they may heighten the stability by modifying the drug release pattern with reduced side effects. Microsponges Delivery System (MDS) can suspend or entrapped a wide variety of substance which act as carrier and can then be incorporated into a formulated product such as a gel creams or powder. The main aim of the formulation is to achieve desired concentration of the drug in the blood. Microsponges of its porous nature that are mostly used for topical application but recently been used for oral administration. Microsponges are design to deliver a pharmaceutical active ingredient in efficiently without adverse effects in sustained manner, one of the best feature of Microsponges is it has self-sterilizing property, numerous study has confirmed that Microsponges are non-irritation non-mutagenic non-allergic and nontoxic.

KEYWORDS: MICROSPONGES, SUSTAINED RELEASE, EFFECTIVE DELIVERY, REDUCED SIDE EFFECTS, LOCAL ACTION, FIRST PASS HEPATIC METABOLISM, TRANSDERMAL DELIVERY.

1C-101

FORMULATION AND EVALUATION OF GELS CONTAINING CALCIUM CHANNEL BLOCKER DRUG FOR THE TREATMENT OF ANAL FISSURE

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ABSTRACT

objective of the present research was to develop and evaluate gel formulation containing a calcium channel blocker drug i.e. Lercandipine for the treatment of anal fissure. The hydrogels of lercandipine was formulated using various polymers like Carbopol 934, methyl cellulose, HPMC and poly ethylene oxide (POE-301) at a 1 % Polymer concentration but POE-301, 1% showed translucent and stable formulation. The concentration of POE-301 was optimized on the basis of skin permeation studies. The prepared gel of Lercandipine containing 0.5%, 0.8% and 1% concentration of polymer was evaluated for viscosity, P^H, Drug content uniformity, Homogenicity and in-vitro skin permeation studies. It was found that all optimized hydrogels were homogenous and viscosity (68.76 ±0.005, 75.41±0.002, 98.67±0.011), P^H (5.55 ±0.015, 5.50 ±0.005, 5.45±0.008) and drug content uniformity in terms of % drug availability is (96.65 ±1.03). The % of cumulative amount of drug permeated for 0.5%, 0.8% and 1% hydrogel was 51.62%, 41.31% and 35.06% respectively while marketed preparation showed 56.31% of drug permeation at the end of 24 hrs. Therefore, 1 % gel was optimized as more amount of lercandipine was localized in the skin having highest flux in comparison to other gel preparations and marketed preparation for the treatment of chronic anal fissure.

KEYWORDS: LERCANDIPINE, ANAL FISSURE, HYDROGEL, POE-301, SKIN PERMEATION.

1C-102

SCREENING OF COMPONENTS OF NANOEMULSION SYSTEM FOR TRANSDERMAL DRUG DELIVERY AND DEVELOPMENT OF ANALYTICAL METHOD

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ABSTRACT

Cilnidipine is new fourth generation calcium channel blocker used in treatment of hypertension. It shows low oral Bioavailability around 13% due to low solubility (belonging to BCS class II) and extensive first pass metabolism. The current approach focuses on screening of excipients for development of Cilnidipine transdermal nanoemulsion formulation with enhanced solubility, absorption and bioavailability.

form inclusion complex with most of the compounds. They have the ability to increase the physico-chemical properties of drug through complexation. Inclusion complex of mechlorethamine with β- cyclodextrin and its derivatives HP-β CD, RM β-CD, Epi-β-CD was prepared by kneading method. The prepared complex was characterization by FTIR, DSC, drug content and in vitro drug release study. This complex was encapsulated into solid lipid nanoparticles and was evaluated. Phase solubility study showed that solubility was increased linearly with the increasing concentration of cyclodextrin. The increase in solubility with Epi β CD was 50 times more as compared to HP-β-CD. The prepared nanoparticles were smooth and spherical in shape with size range from 115-130 nm and zeta potential of 22 to 29 mV. The drug release of NPs followed biphasic release pattern of initial burst and slow sustained release later. Moreover, these cyclodextrin based nanoparticles exhibited good cytotoxicity activity as compared to pure drug. Thus, cyclodextrin based nanocarriers can be successfully used in treatment of cancer with enhanced therapeutic activity.

KEYWORDS - CYCLODEXTRIN, LEUKEMIA, NANOPARTICLES, BIOAVAILABILITY.

1I-21

TITLE: LONG CIRCULATING LIPOSOMES OF SEMISYNTHETIC ANTINEOPLASTIC AGENT FOR PROLONGED ACTION.

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ABSTRACT

Very soluble semisynthetic antineoplastic agent, Vinorelbine tartarate is solubilized in aqueous core of lipid spheres of phospholipids bilayer. The neutral lipid phosphotidyl choline is used for encapsulation along with surface modifying agent. Phospholipids, are ubiquitous in nature and are key components of the lipid bilayer of cells.The encapsulation of vinorelbine overcomes the major drawback of local irritation and direct exposure to cytotoxic drug in intravenous injection. Surface modification of Liposome formulation prolongs the action of vinorelbine by slow release.

Vinorelbine tartarate is an anticancer cytotoxic drug acting by inhibition of mitosis. It has been approved to treat metastatic breast cancer. Liposomes loaded with vinorelbine tartarate were prepared by ethanol injection method using DSPC and Cholesterol. The drug incorporated was 5% of the lipid. It is surface modified using various concentrations of MPEG-DSPE2000. For the optimized pegylated (stealth) liposomes, the particle size and zeta potential values were 174.5±5 (PDI 0.243±0.05) and -3±5mV whereas the drug content and entrapment efficiency were 85±5% and 75±3%. Light microscopic and Transmission electron microscope images revealed the exact morphology of liposomes. The in vitro release studies of surface modified liposomes showed prolonged release upto 24 hours. The liposomes were found to be stable at 40C and Room Temperature. A liposomal drug is in effect a prodrug, inactive until released from the carrier, rendering it bioavailable and capable of subsequently acting on its target.

3 KEYWORDS- LIPOSOME, VINORELBINE TARTARATE , ETHANOL INJECTION

1I-22

IMPROVEMENT OF ORAL DELIVERY OF LIPOPHILIC DRUGS BY SOLID SELF EMULSIFYING DRUG DELIVERY SYSTEMS (S-SEDDS)

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ABSTRACT

Approximately 40% of new chemical entities exhibit poor aqueous solubility and present a major challenge to modern drug delivery system, because of their low bioavailability. Self-emulsifying drug delivery systems (SEDDS), which are isotropic mixtures of oils, surfactants, solvents and co-solvents/ surfactants, can be used for the design of formulations in order to improve the oral absorption of highly lipophilic drug compounds. Conventional SEDDS, however, are mostly prepared in a liquid form, which can produce some disadvantages. Solid SEDDS (S-SEDDS), prepared by solidification of liquid/semisolid self-emulsifying (SE) ingredients into powders, have gained popularity. Hydrophobic drugs can often be dissolved in SEDDS allowing them to be encapsulated as unit dosage forms for peroral administration. When such a formulation is released into the lumen of the gut it disperses to form a fine emulsion, so that the drug remains in solution in the gut, avoiding the dissolution step which frequently limits the rate of absorption of hydrophobic drugs from the crystalline state. Ultra-low oil-

for antiasthmatic potential using in vitro goat tracheal chain preparation model and in vivo milk induced leukocytosis and eosinophilia clonidine and haloperidol induced catalepsy in mice model and clonidine induced mast cell degranulation in rat model. Among all extracts ethyl acetate extract was found to be most active and rich in flavonoid which is confirmed by thin layer chromatography. Present study thus suggests the significant antiasthmatic potential of Cassia auriculata. The experimental evidence obtained in the laboratory model could provide a rationale for the traditional use of this plant as antiasthmatic.

KEYWORDS: CASSIA AURICULATA, ANTIASTHMATIC ACTIVITY, IN VIVO AND IN VITRO ANTIASTHMATIC MODELS

3E-42

EXTRACTION, EVALUATION & FORMULATION OF LEAF ESSENTIAL OIL FROM *MURRAYA KOENIGII* FOR ANTI-DIABETIC ACTIVITY

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ABSTRACT

Murraya koenigii is an indigenous plant showing anti-diabetic potential, the phytoconstituents responsible for the activity are yet to be evaluated.

In the present study, the essential oil from leaves of Murraya koenigii leaves was extracted and evaluated for physicochemical properties. A HPTLC method was developed to estimate the amount of marker compound. The essential oil was screened for anti-hyperglycemic activity using invitro models and Oral glucose tolerance test (OGTT). It was further evaluated in streptozotocin (STZ) induced diabetic model. The essential oil was formulated into self micro emulsifying drug delivery system (SMEDDS) and evaluated for stability.

The yield of volatile oil extracted from leaves was about 1.4 % w/w. The HPTLC method was developed for the estimation of β caryophyllene in the essential oil. The essential oil showed antioxidant, alpha glucosidase and alpha amylase enzyme inhibition and glucose uptake in in-vitro assays. The essential showed anti-hyperglycemic effect in OGTT. The study of essential oil in STZ induced diabetic rats showed reduction in serum glucose levels and glycosylated hemoglobin and improved the serum lipid profile. The volatile oil was formulated into SMEDDS and evaluated for stability.

The essential oil from leaves of *Murraya koenigii* has good antidiabetic potential and can be used in conjunction with current antidiabetic agents after further evaluation.

KEYWORDS: MURRAYA KOENIGII ESSENTIAL OIL, STREPTOZOTOCIN, ANTI-DIABETIC, HPTLC, SMEDDS

3E-43

AN OVERVIEW OF *ABELMOSCHUS ESCULENTUS* FOR THE PREVENTION, MITIGATION AND TREATMENT OF INSULIN DEPENDENT DIABETES MELLITUS

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ABSTRACT

Diabetes is a chronic disease which characterised by hyperglycemia (elevated or abnormally high blood sugar levels) and other metabolic disturbances, including metabolism of lipids and haemostasis. The objective of this review will focus on the health benefits of Abelmoschus esculentus (AE) which will lead to assess the complications caused by diabetes. Many researchers are still on search for various in-vitro methods to control this silent disease. These were published in various scientific databases like Medline, Hub med, and printed manuscripts on herbal medicines which revealed the scenario of diabetes and its manifestations. From these literature it was confirmed the prevalence of preventive effects of Abelmoschus esculentus on chronic diseases due to antioxidant effect exerted by high contents of natural flavonoids. Myricetin a commonly found flavonoid from Abelmoschus esculentus had shown protective effect in diabetes associated nephropathy, glaucoma and cataract. Abelmoschus esculentus can prevent and manage hyperglycemia, ingested regularly as a dietary supplement. Regular inclusion of Abelmoschus esculentus in daily diet (3 times in a week) can reduce the effect of blood glucose level as it regulates the process of hormone function. This will provide effective protection against diabetes and diabetic induced hyperglycemia as this plant is rich in natural components which can be easily taken up by any age group of