Scientific Tracks & Sessions
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2nd International Conference and Exhibition on

Pharmaceutics and Advanced Drug Delivery Systems

July 05-06, 2019 | Paris, France

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Water inclusion effect on starch 1500 as an excipient used in the production of the oral solid dosage form

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Starch 1500 is a well-known diluent, binder, disintegrant and dissolution enhancer, which is widely used in the formulation of the oral solid dosage forms. To validate the proposed hypothesis that whether Starch 1500 preserves the chemical hydrolysis of the moisture sensitive drugs, the understanding the sorption-desorption behaviour of this excipient is the first challenge. Water molecules when interacting with most of the pharmaceutical excipients and APIs localise within the crystalline part of the physical structure. Specifically, for starch-based excipients, crystal regions of the structure host the water molecules within the double-stranded helices of the crystallite. DSC TGA, FTIR-ATR and NIR techniques were adopted to determine the freezable and nonfreezable bound water with starch 1500, both qualitatively and quantitively. Among different mathematical models, Young and Nelson model have not well practised compared to the other available models, such as BET, GAB, Oswin and Smith models. It was found out that Young and Nelson model along with the GAB theory well carver the sorption isotherms. The variable parameters obtained from these two equations were compared and the monolayer value was estimated. The amount of monolayer coverage with the assumption of the strength of the binding of the water molecules on the first accumulated layer was correlated with the total water content of the Starch 1500. Analysis of the strength of the hydrogen bonds between Starch 1500 and the water molecules, mobility and the availability of the reactive water molecules to take part in chemical hydrolytic reactions could be explained.

Speaker Biography

Saeid Rajabnezhad is a registered pharmacist since 2009. Beside working as a community and hospital pharmacist, his main professional activities are formulation development, quality control and production of oral solid dosage forms as an industrial pharmacist. He has served various roles such as R&D, QC and deputy of production manager in several pharmaceutical companies. He was then joined the research group of Prof Ali Nokhodchi at the University of Sussex, UK as a PhD researcher. His research is funded through the University of Sussex and Colorcon Ltd. Saeid is in his final year of PhD programme. He has published several articles in peer-reviewed pharmacy journals in pharmaceutical technology, drug delivery and nanoparticulate matters, powder engineering, characterisation as well as analytical method development.

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The influence of eudragits and PVP on the modified release of Furosemide

Marilena Vlachou, Angeliki Siamidi and **Efthimia Geraniou**
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Furosemide 4-chloro-2-[(furan-2-ylmethyl) amino]-5-sulfamoylbenzoic acid, is widely used as diuretic for the treatment of high blood pressure and fluid retention caused by heart failure or kidney disease. It is considered as a loop diuretic, which inhibits the re-absorption of sodium in the thick ascending limb of the loop of Henle and it is effective in cases of renal failure. Furosemide is characterized by a low solubility and poor permeability in the upper GI tract, thus is classified in the BCS system, as an IV drug. However, with the entrance of furosemide in intestinal fluids a rapid release of the drug occurs, which is accompanied by an increased natriuretic and diuretic effect, causing displeasure to the patients. As a result, a slow release formulation would be probably preferred by patients, because of a lower initial diuretic effect and a more extended duration of action. To this end, we extended our previous research on the modified release of this drug by using PVP and different grades of Eudragit polymers. Eudragits are commonly used when it is required to modify the release rate, and the different grades of polymer offer a variety of physicochemical properties depending on what is desired. These excipients were formulated, in the context of this work, in matrix systems for oral administration.

Speaker Biography

Marilena Vlachou is an Assistant Professor at the National and Kapodistrian University of Athens (NKUoA), Greece. After obtaining her Pharmacy degree from NKUoA, she conducted research related to novel Pharmaceutical Technology techniques at the University of Rhode Island, USA, as a Visiting Research Scientist. She then moved back to Greece to pursue PhD studies on Physical Pharmacy/Pharmaceutical Technology. In her capacity as a member of staff of NKUoA, she teaches two undergraduate courses and one postgraduate, all related to the field of Pharmaceutical Technology. She has co-authored the textbook entitled “Pharmaceutical Technology I: Principles of Physical Pharmacy and Nanotechnology”, 2007, Parisianou Editions, Athens-Greece, (ISBN: 978-960-394-487-4), and has presented her research work in more than fifty International and Domestic Scientific Conferences and has published more than thirty five articles in peer-reviewed Journals. She is a member of Greek Pharmaceutical Society, Greek Society of Pharmaceutical Technology and Greek Society of Cosmetology.

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Hormonal cascades of pregnancy: How drug delivery can regulate peri and post-partum neurogenesis and emotional outcomes among women

Tabinda Hasan, Kavitha ganesh and **Teseen Fatima**
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Numerous factors govern mood changes of pregnancy; like physiological/biological changes related stress, metabolism changes, or shifting levels of estrogen, progesterone and Oxytocin hormones. Ovarian hormones prepare the maternal body for successful fertilization while placental hormones facilitate maternal adaptations to ensure optimal fetal development and maintain pregnancy; Changes in hormone levels can significantly affect production of neurotransmitters that regulate mood. Every woman responds to these changes differently. Some experience heightened emotions, while others feel depressed or anxious. It has been generally observed that moodiness flares around 6-10 weeks of pregnancy, eases during second trimester, and reappears as the 'due date' approaches.

Prolactin stimulates nursing, Oxytocin is a 'feel good hormone' that stimulates maternal feelings of love and bonding for the baby while sudden variations in 'Progesterone- Estrogen levels' during pregnancy and after delivery have been notoriously linked to depression or anxiety. These hormone cascades are regulated by positive & negative feed-back mechanisms. In 'sudden termination of pregnancy' events as well as 'extended breastfeeding' or 'abruptly ended breast feeding'; maternal adaptations to changed hormone levels are insufficient and extreme outbursts like self-harm and even harming of the baby might occur. The maternal brain is remarkably plastic and exhibits multifaceted neural modifications. Hormone delivery mechanisms can facilitate affective neurogenesis and development of cordial neural networks. Hence, choosing and delivering 'appropriate doses' of 'required hormones' along temporally coordinated mechanisms might positively influence psycho-social and maternal and child health outcomes. This review highlights peri-partum adult neurogenes and associated mood changes with underlying hormonal mechanisms. It also elucidates the functional consequences of neurogenesis in the peripartum brain and the extent to which this process might play a role in maternal care, cognitive functions and postpartum mood. Finally, the study examines and discusses the effects of hormone dependent maternal neurogenesis on parenting styles.

Speaker Biography

Tabinda Hasan has completed her PhD at the age of 30 from Aligarh Muslim University, India. She is an Assistant Professor at Princess Nora University, Saudi Arabia. She has over 40 publications that have been cited over 200 times, and her publication H-index is 10 and she has been serving as an editorial board member of several reputed journals.

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Comparative pharmacokinetic study of Ledipasvir after single dose using novel methodology

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Background: Ledipasivir (LEDV) is a direct acting antiviral used for treatment of hepatitis C, especially in GT4 infection via termination of HCV proliferation inside the body and has the advantage of dose reduction compared to the other traditional antiviral agents. Dose adjustment is highly important for improving the efficacy of therapy and decreasing both the side effects and patient health's care cost. To obtain clinically trusted data, we should use highly sensitive and selective bio-analytical techniques, capable of using small sample volumes, with no interferences from endogenous or exogenous compounds.

Aim of work: Therefore, pharmacokinetic study of LEDV was investigated using novel validated highly sensitive sensor obtained in our laboratories and comparing the results with the reported results obtained by using LC/MS/MS technique.

Method: Six volunteers had fed prohibited for 12 h before the study but the water was freely available. The blood samples (3.0 mL) were collected from a forearm vein into heparinized polyethene tubes at 0.00 (pre-dose), 0.5, 1.0, 1.5, 2, 2.5, 3, 3.5, 4, 6, 10, 13, 18, 24 h after oral administration of Harvoni®400/90 mg tablets. The samples were immediately centrifuged at 4000 rpm for 10 min. The plasma was stored at −80ºC until analysis. The pharmacokinetic parameters for LEDV were estimated using the validated moment analysis software.

Results: The methodology was fully validated according to FDA guidelines with respect to linearity, accuracy, precision, recovery, selectivity. The sensitivity of the method was found to be sufficient for accurately measuring the main pharmacokinetic parameters for LEDV. The validated methodology was successfully applied to determine LEDV in human plasma after oral administration of a tablet containing 400/90 mg SOF/LED. Following absorption, LEDV reaches maximum plasma concentrations (T max) at 4.23± 2.09 h post-dose and is eliminated with (t½) of 31.1± 2.6 h. The Cmax was 183.7± 25.6 ng/mL, while AUC 0-t and AUC 0-∞ were 3709±1033 and 4201± 2345 ng/mL.h, respectively. The elimination rate constant (Ke) and clearance (CL) were 0.026± 0.0001 h-1 and 0.034± 34.6 mg/(ng/mL h), respectively. Our study proved that there was no significant difference in pharmacokinetic parameters with other reported data.

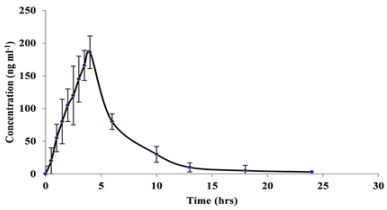

Figure 1. Mean plasma concentration of LEDV measured by RGO/ NS Ni Fe2O4/ MHS/GCE (±SD) using DPV at optimized conditions following administration of single oral dose of Harvoni® tablets.

Speaker Biography

Saad Alkahtani is currently Dean for College of Pharmacy at Najran University, Saudi Arabia. He is also an Associate Professor of Clinical Pharmacy, College of Pharmacy. Saad holds a PhD in Pediatric Clinical Pharmacology from the University of Nottingham, UK, 2013. He earned his Master's Degree from University of Glasgow, UK, 2009 and his undergraduate studies at King Saud University, Saudi Arabia, 1999. His research interest lies in evaluating cultural perceptions of, and access to healthcare and pharmacy services. His other research interests include pharmacoepidemiology and counterfeit medications. He has collaborated actively with researchers in several other disciplines of pharmaceutical sciences, particularly drug designing. He serves and has served in various committees at the Faculty. He is and has been a member of various national and international committees and working groups in the area of clinical pharmacy and pharmacy education. He has published many peer reviewed journal articles and conference papers and he is a reviewer for several international peer-reviewed journals.

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Detecting and profiling extracellular miRNAs among some Wilms Tumor Moroccan patients using molecular biology tools

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Nephroblastoma or Wilms Tumor (WT) results from the abnormal kidney development at embryonic stage. WT is the most common childhood renal malignancy (95 %) that affects approximately 1/10000 children. Its current diagnosis approach (medical imaging and pathological exam) takes a long time before defining the appropriate treatment that is generally presented in chemotherapy, surgery and X-Ray treatment, which have harmful side effects on children's health.

The genetic and epigenetic factors associated with Wilms tumor are the WT Suppressor tumor genes that have an important role in normal kidney development. In the case of nephroblastoma, overexpression of oncomirs (Oncogenic miRNAs) inhibits their expression. MiRNAs are small non-coding RNA sequences of 22nt that regulate post-transcriptional gene expression. Moreover, miRNAs originating from WT are overexpressed, so that we can find them at high levels in blood circulation comparing with other miRNAs. My research interest is to detect and profile extracellular miARNs among some Moroccan WT patients. This has many goals; to use those miARNs as disease biomarkers for diagnosis and prognosis of WT, to understand disease pathogenesis and to correlate miRNA expression patterns with disease progression. MiARNs could even have a role in Cancer therapy by the injection of other miRNAs that inhibit oncomirs. To achieve those goals, many molecular techniques are used from DNA and RNA extraction to DNA sequencing. So far, we've succeeded in extracting miRNAs from different materials as blood, serum, plasma and embedded paraffin tissue. As well as transforming (reverse transcripting) those miRNAs into cDNA for qRT-PCR and sequencing.

Speaker Biography

Sara Benlhachemi is a PhD student at Medical school, Mohammed 5th University, Morocco working on Cancer Epigenetics. Her thesis is about detecting and profiling extracellular miRNAs among some Wilms Tumor Moroccan patients using molecular biology tools. She's under the supervision of Professor EL Mostafa El Fahime at the National Center of Scientific and Technical Research. She had her Master's Degree in Medical Biotechnology in 2016 at Medical school of Rabat. Likewise, her end of study project was under the supervision of Professor EL Mostafa EL Fahime and it was titled: "Approach for highlighting mutations in ENPP1 gene among Moroccan patients with Pseudoxanthoma Elasticum". She had her Bachelor's Degree in 2014 at Faculty of Sciences and Techniques – Mohammedia, her end of study project was about the assessment of the early screening and diagnosis of HIV infection in Morocco following the introduction of the quick blood test, under the supervision of Dr Elmir ELHARTI at the National HIV Reference Laboratory of the National Institute of Hygiene –Rabat.

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Dual loaded actively targeted liposomes for anti-resistance treatment of melanoma

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Melanoma is one of the deadliest cancers with very low response and survival rates. Main reason of poor outcomes of therapy is the inherent resistance of melanoma cells. Survivin is a protein which is overexpressed by melanoma cells and is known to impart resistance to them against apoptosis which is supposed to be induced by chemotherapy. Eugenol has been reported to inhibit survivin in breast cancer cells. Thus, in order to fight resistant melanoma in a more efficient manner, we formulated hyaluronic acid (HA) coated liposomes loaded with eugenol along with dacrabazine which is the gold standard chemotherapeutic agent used for melanoma treatment. After synthesizing the liposomes using solvent injection method, QbD was applied to optimize and obtain a final formulation with desired quality attributes. The optimized formulation was then subjected to performance analysis in cell lines and animals. Coated-Dacarbazine Eugenol Liposomes were found to possess almost 9 folds more cytotoxicity than dacarbazine solution against melanoma cell lines (at dacarbazine concentration of 0.5 µg/ml). The number of late apoptotic cells was also found to be much higher in formulation treated cells in comparison to dacarbazine solution treated cells. Migration assay and proliferation study also indicated towards considerably greater inhibition of cell migration and proliferation by Coated-Dacarbazine Eugenol Liposomes, signifying its potential against metastasis. Results of pharmacodynamic study on melanoma bearing C57BL/6 mice revealed that our formulation could significantly delay the tumor growth in comparison to dacarbazine solution; and biodistribution study confirmed the long circulating nature of the formulation. Thus, the results of this study indicate towards better possibilities of melanoma treatment if the treatment is focused on specific resistance mechanism of this deadly cancer.

Speaker Biography

Harshita Mishra is about to finish her doctorate in Pharmaceutics from Jamia Hamdard University, India. She has 14 international publications and around 300 citations. She has also written 5 book chapters in books edited by Elsevier, Stanford etc. Her educational background includes Bachelor of Pharmacy, Master of Pharmacy and Post Graduate Diploma in Intellectual Property Rights. She is a two times qualifier of GPAT which is an all India level aptitude and evaluation exam. She has twice received Elsevier's 'Top 25 Hottest Articles' award for her paper on metal nanoparticles. She has presented papers in 7 International and National Conferences and won awards in 3 of them. Her areas of interest include Nanotechnology and Cancer treatment.

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Exosomes: Growing interest as vectors of molecular entities

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Exosomes are a type of extracellular vesicle (EV) having a unique generation pathway and characteristics. EVs characteristics and cargo vary by the type and state of the cells involved in their generation. They naturally carry such diverse cargo as RNA, DNA, lipids, peptides and vast array of proteins

Exosomes are produced by many types of cells and have been discovered in nearly every bodily fluid. Their presence has been reported in the growth medium of many cultured cells, including B lymphocytes, dendritic cells, cytotoxic T-cells, intestinal epithelial cells, neurons, oligodendrocytes, platelets, mast cells, and Schwann cells. They have been demonstrated to be active in immune response; neural communication; reproduction and development; as well as in cell proliferation, homeostasis and maturation. Interest in exosomes is growing due to the discovery of their potential in so many research, diagnostic, analytic and therapeutic procedures.

Reasons for interest in exosomes include their observed paracrine-like activity (replacing the communication exhibited by their cells of origin) and their use as a vector of proteins, nucleic acids or small-molecule drugs in therapeutic applications. There are many approaches being pursued to use exosomes as a vector of therapeutic agents. The primary way is to employ a means of disruption of the membrane (such as shear-forces) to allow passive diffusion of drug substance into the exosome. Others describe their modification through the fusion of exosomes with liposomes harboring desired proteins, lipids or synthetic polymers. Some have even proposed such creative manufacturing approaches as the in vitro mass-production of exosome-mimicking nanovesicles using a mini-extruder.

Codiak is a biotech start-up that has raised nearly $170 million toward development of exosomes in therapeutic applications. They and others are manipulating exosomes to solve drug delivery issues for small molecules, RNA therapies, proteins, viral gene therapy, and even CRISPR gene-editing tools.

Speaker Biography

William Whitford is Strategic Solutions Leader, BioProcess, GE Healthcare, USA with over 20 years' experience in biotechnology product and process development. He joined the company 16 years ago as a team leader in R&D developing products supporting biomass expansion, protein expression and virus secretion in mammalian and invertebrate cell lines. Products he has commercialized include defined and animal product-free hybridoma media, fed-batch supplements, and aqueous lipid dispersions. An invited lecturer at international conferences, he has published over 250 articles, book chapters and patents in several areas of bioproduction. He now enjoys such industry activities as serving on the editorial advisory board for BioProcess International.

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Piscicidal plants of Nepal: Toxicity Screening on fish

Augusthy Kulakkattolickal
City Colleges of Chicago, USA

A survey of the aboriginal fishermen in Chitwan District of Nepal identified the native names of 97 species of plants believed to possess piscicidal properties. Ninety-two were collected and identified. Eighty-two of these were tested for toxicity using grass carp (*Ctenopharyngodon idella*) fingerlings as test organisms. Thirty-six species that killed the fingerlings within 2 hours at 1% (w/v) extract concentration or less were categorized as poisonous. Extracts of these 36 Nepalese plant species were tested for toxicity on three species of predatory air-breathing fish (*Ophiocephalus punctatus, Clarias batrachus* and *Heteropneustes fossilis*) inhabiting the farm ponds. Out of these 36 plants, the ripe fruit of *Catunaregam spinosa* (Thunb.) Tirveng. (syn. *Randia dumetorum* Poir) (Rubiaceae) was the most toxic, with an LC50 value below 0.02–0.04% on the three species of fish; it lost its toxicity in 204 hours. The second most toxic of these 36 plants was *Polygonum hydropiper* L. (Polygonaceae) shoot extract and had LC50 values of 0.02–0.06% for all the three species of fish and lost its toxicity in 13 hours.

Aqueous extracts of dried, ripe fruit of *C. spinosa* tested for toxicity under laboratory conditions had a 5-hour LC50 of 0.0036% (weight/volume) for *Heteropneustes fossilis*. The dried shoot extract of *P. hydropiper* had a laboratory LC50 value of 0.096% for *Heteropneustes fossilis.* The environmental advantage of using these plant toxins to eradicate predatory fish before cultivating the economically viable species of fish is that the toxic effect disappears within a certain time period. The active ingredients in any of these plants were not isolated during this research. This research was funded by the Canadian International Developmental Research Centre (IDRC) and had resulted in three publications.

Speaker Biography

Augusthy Kulakkattolickal has three Master's Degrees (Masters in Experimental Biology from McGill University, Canada, Masters in Public Health from the University of Illinois, USA, and Master's in Zoology from the University of Calicut, India. His publications of the piscicidal plants of Nepal has been cited hundreds of times as updated by ResearchGate. Currently he is working as a Professor of Biology (Anatomy & Physiology) at City Colleges of Chicago, USA. Among other things, his expertise involves establishing cadaver theater/lab and planning cadaver prosection to teach Human Anatomy & Physiology for students pursuing medical careers.

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Phyto-formulations for Matrix Metalloproteinases (MMPs): Novel targets in UV radiation induced skin Carcinoma

Swarnlata Saraf
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The continuous exposure of skin to ultraviolet radiations generates reactive oxygen species leading to photoaging that causes degradation of dermal collagen and degeneration of elastic fibers. These fibres provide mechanical strength to the skin. In order to maintain the appearance of the skin, a complete understanding of the mechanism behind skin cellular degradation is desired, so that a better cosmetic formulation can be formulated. The studies have been shown that macrophages are crucially involved in skin Carcinoma and express significantly higher levels of M1 (CD40, CD127) and M2 (arginase I) markers as well as higher levels of MMP-9, a pivotal enzyme in cancerous matrix remodeling and cancerous invasion, than macrophages from the basal cell carcinomas. These macrophages represent different receptors like folic acid receptors which was exploited to know the extent of efficacy for delivery of phyto-formulations containing nanoparticles, transferosomes, liposomes etc. to cure carcinoma. The flavanoidal rich natural bioactives have been extensively incorporated in a suitable base and have proven their potential as a topical photoprotectants but their activity remained restricted due to poor solubility profile. Now researchers are working to design the Novel Targeted formulations to deliver these natural flavanoidal drugs to improve its efficacy and ultimately skin properties. In current years, the focus area of work is on some traditionally used bioactive moieties as natural matrix metalloproteinases inhibitors (MMPIs) and emphasized on more extensive and specific studies, so that a good combination of natural as well as synthetic MMPIs with the conventional drugs can be used for treating UV radiations induced ailments.

Speaker Biography

Swarnlata Saraf is serving as a Professor at Pt Ravishankar Shukla University, India since last 14 years. Her field of specialization is Pharmaceutics and Research area of interest includes herbal formulations, drug delivery and exploring targeting aspects of novel phyto-formulations. She has expertise in developing phyto-formulations and passion in improving wellbeing of the society. She gains this experience by continuous and consistent efforts of her work in cosmetic and drug delivery laboratories in the institute. she is associated with many national apex bodies like NAAC, UGC, PCI, AICTE, and CRS as member and as an expert in different committees. She also served as an expert of grant evaluator of Israel Science Foundation. She Innovated Technology for Value edition to existing herbs in Chhattisgarh & engaged in promotional activities like Promotion of Janaushadi Kendra by dept. of family welfare, Govt. of India, Regular interaction with pharmacists. She is also Involved in awareness programmes through Shakti-Vigyan Bharati relating to health & hygiene, Sustainable development and education for women, Regular activities are organized for public awareness.

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A comparative study of co-processed natural disintegrants with the commonly used disintegrants

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The present research work deals with preparing spray dried co-processed natural disintegrant which has an excellent disintegration efficiency. Based on the preprimary trial results, chitin and corn starch were selected as an excipients to be co-processed and range of the processing parameters for spray drying were optimized. 3^2 Full factorial design was applied, where ratio of chitin:corn starch (X1) & In-let air temperature (X2) were selected as independent factors. Here wetting time, water absorption ratio and In-vitro disintegration were selected as dependent response variables. Comparative evaluation of the optimized co-processed natural disintegrant, Sodium starch glycolate (SSG) and Cross carmelose sodium (CCS) were carried out by formulating tablets with the propranolol hydrochloride and Ibuprofen. Lowest In-vitro disintegration time, wetting time and water absorption ratio for the Lactose monohydrate and D- Mannitol tablets were 29 sec, 30 sec, 75.12% and 31 sec, 28 sec, 80.07%. Almost similar results were obtained in the tablets with Lactose monohydrate and D-Mannitol as a diluent. Optimized batch having Chitin:corn starch in a 50:50 ratio when spray dried at In-let air temperature of 180 °C, provides co-processed natural disintegrant having excellent disintegration efficiency. All the evaluation parameters of the optimized batch met the acceptance criteria. In-vitro disintegration time of formulated propranolol hydrochloride tablets with optimized co-processed natural disintegrant, SSG and CCS were 31 sec, 58 sec & 52 sec respectively. In-vitro disintegration time of formulated Ibuprofen tablets with optimized co-processed natural disintegrant, SSG and CCS were 25 sec, 33 sec & 30 sec respectively. Stability data of all tablets shows no significant change during stability period & they were in an acceptable range. It was found to have versatile disintegration efficiency without being affected by the type of diluent used and without being affected by the class/dose of active pharmaceutical ingredient to be used with. Order of the disintegration efficiency was Co-processed natural disintegrant > CCS > SSG.

Speaker Biography

Jaydeep Patel has completed his PhD at the age of 29 from Hemchandracharya North Gujarat University, India. He is working as Class-II Senior Lecturer at B K Mody Government Pharmacy College, India. affiliated with Gujarat Technological University, India. He has more than 10 years of teaching and research experience. His area of research is preformulation and novel drug delivery system. He has published and presentated various research papers in many National and International conferences.

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