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High Performance Liquid Chromatography- A Short Review

Deepika Bindu B*, Dimpu Sai Vinusha D, Nagavamshi G and Harish D.

Department of Pharmaceutical Analysis, Malla Reddy Institute of Pharmaceutical Sciences, Secundrabad.

*Corresponding author e-mail: burjukindideepikabindu@gmail.com

ABSTRACT

High performance liquid chromatography (HPLC) is an important qualitative technique, generally used for the estimation of pharmaceutical and biological samples. It is the most versatile and safest, dependable and fastest chromatographic technique for the quality control of drug compound. The HPLC principle is based on the distribution of the components between a stationary phase (HPLC column) and a mobile phase (solvent). Depending on the chemical structure of the molecule they are retarded as passing the stationary phase. Between 1941 and 1960, scientists predicted that the liquid chromatography could be operated with high efficiency by reducing the column packing particle size to around 150 μm and flowing the mobile phase at increased velocity. As a result, in the 1970s, many developments were seen around instrumentation and hardware. HPLC analyzes fall into four different categories: Reverse phase, normal phase, size-exclusion method and ion exchange method. The instrumentation includes solvent reservoir, pump, sample injector, micro bore segment, detector, data collection device and integrator. Validation is the process of establishing the performance characteristics and limitations of a method and identification of the influences which may change these characteristics and to what extent. The various validation parameters are Accuracy, Precision, Repeatability, Linearity, Detection limit, Quantitation limit, Specificity, Range and Robustness.

Keywords: Normal phase chromatography, Instrumentation and Validation.

"NATURE TO NEW": SPONDIAS PINNATA LEAVES GREEN ENGINEERED SILVER NANOPARTICLES AS POTENTIAL ANTICANCER AGENTS & ANALYTICAL FINGERPRINTING STUDIES – AN ECOFRIENDLY APPROACH FOR NATURAL PRODUCTS DRUG DISCOVERY

V Arun Reddy[1*], V Narmada[2*]

[1] Department of Pharmacy, Pharmaceutical Analysis & QA, University College of Technology(A), Osmania University, Tarnaka, Hyd-500 007, TS, India*

[2] Assistant Professor, Department of Pharmacy, University College of Technology(A), Osmania University, Tarnaka, Hyd-500 007, TS, India*

*E-mail: ArunOUPharma939@gmail.com

Abstract

Introduction: WHO estimates that 80% of the world populations currently use herbal drugs for major health care. Fingerprinting is a process that determines the concentrations of a set of characteristic chemical substances in an herb. Knowing the relative concentrations is a means of assuring the quality of herbal preparations. It can serve as a tool for identification, authentication and quality control of herbal drugs. Nanotechnology has changed the outlook of researchers towards science and technology. The enhanced surface area of the particles due to their nano size is contributing to the wide range of applications are used.

Background: No reports on synthesis of silver nanoparticles and Isolation.

Materials and Methods: Biosynthesis of silver nanoparticles was done by hot plate method and synthesized silver nanoparticles are characterized by SEM, TEM, XRD, Nanoparticle analyzer, FTIR and UV (Size and morphology, crystalline nature & size , zeta potential & charge, Functional groups and confirmation of synthesis of silver nanoparticles) respectively.

Extraction by soxhelt apparatus and column chromatography for isolation of compounds. GC-MS analysis of extracts. Structure elucidation was confirmed by IR,NMR ,MASS spectra's. Anticancer activity was performed on MCF7 cells by In-vitro (MTT Assay).

Results: β-sitosterol was isolated from n-hexane fraction and GC-MS analysis shows the new components present in spondias pinnata. Preliminary confirmation from UV-Visible peak around 424 nm , SEM(50nm), TEM(Spherical), XRD(22.5nm), zeta potential(-21.2mV & -ve charge) and FTIR(C-H,O-H,C=C stretching and bending of alkane, alkene and aromatic groups of lipds proteins,etc)

Anticancer activity IC50 value was 58.41 ± 0.864 more than standard drug (IC50 is 6.36 ± 0.317.

Conclusion: An eco-friendly, rapid & convenient method was reported for synthesis of silver nanoparticles. β-sitosterol was isolated .Anticancer activity was more than the standard anticancer drug.

TITLE: Area Under Curve and Zero order UV-Spectroscopic Methods for the estimation of Chrysin in Bulk and Dosage form: Development and Validation.

Authors: Sushmita Hiremath*, Mahesh Palled, Akanksha Bhatkhande, Kiran Patil, Shailendra Suryawanshi.

***-Presenting Author.

Subject Code: CHE

ABSTRACT

Introduction: Chrysin is an oral antihistamine used to treat itchy skin rashes, urticaria, and allergic responses. It is crucial to develop suitable analytical methods for the evaluation of Chrysin in order to provide more selective, sensitive, and quick assay methods than those previously reported. The creation and validation of an ICH-compliant stability-indicating UV-Spectroscopic method was the main objective of this research.

Method: The mobile phase for the UV Spectroscopic technique was a mixture of water and methanol in a 60:40 v/v ratio. The wavelength of chromatin absorption was determined to be 269 nm.

Results: The linearity of chrysin ranged from 2 to 10 g/ml. Chrysin showed a 0.9997 regression coefficient for the absorbance and area under curve. %RSD that was less than 2 for both absorbance and area under curve for the parameters of precision (intraday and interday), ruggedness and robustness. Chrysin drug purity was found to be between 96 and 106%.

Conclusion: The UV methodology was more accurate, sensitive, and cost-effective than the previously developed UV-Spectroscopy method due to its quicker action. At 269nm, UV detection was accomplished respectively. The same lamda max was used for an assay as well. The evaluation of Chrysin was found to be appropriate for the approach created for UV Spectroscopy. The established UV-Spectroscopy approach for routinely analysing the medication Chrysin is accurate, linear, precise, simple, and robust.

FDA’s new pharmaceutical quality initiative: Knowledge-aided assessment & structured applications

Rutuja Hasure, M Pharmacy 1st semester,

Regulatory Affairs, G Pulla Reddy College of Pharmacy, Mehdipatnam.

Subject Code: PRA

Abstract

The FDA‟s new pharmaceutical quality initiative: Knowledge-aided assessment & structured applications (KASA). The aim of USFDA is Timely development, assessment, and approval of safe and effective drugs is pivotal for assuring the American public has access to quality medicines. At present, the new drug and generic quality assessment is performed using a written narrative. To modernize the assessment of drug applications, a KASA system has been initiated. KASA could become a system that captures and manages information about a drug product including risk identification, mitigation and communication, and control strategy. It does this through a structured IT framework that could completely replace the current unstructured text-based, narrative assessment.

Keywords: Knowledge-aided assessment & structured applications (KASA), USFDA, Office of Pharmaceutical Quality (OPQ), failure mode, effects and criticality analysis (FMECA)

Pharmaceutical analysis

Abstract

Analytical techniques for emerging and persistent organic contaminants and pollutants

Syeda Farheen Sultana

G.Pulla Reddy college of pharmacy, Mehdipatnam, Hyderabad

Environmental contamination has recently grown to be a major issue on a global scale. Several synthetic organic chemicals are mostly used in agriculture, industrial manufacture, and medicine for both people and animals. Most chemical substances degrade easily and spend little time in the environment. However, some organic molecules behave as pollutants because they are persistent in the environment, their concentration is constant, or they are toxic to living things. The term "persistent organic compounds" refers to organic substances that are resistant to physicochemical and biological degradation and, as a result, remain in the environment and biological systems. POPs include industrial compounds like polychlorinated biphenyls, chlorinated insecticides, and unintentional by-products like dioxins. On the other hand, emerging organic contaminants are organic pollutants that have just recently been identified or found in the environment as a result of recent developments in analytical techniques. According to numerous studies, eating contaminated foods (of animal origin) is the most prevalent method for both people and wild animals to become exposed to POPs and EOCs. This exposure occurs in a variety of ways, with each having different effects. The method that is most frequently used to identify volatile and thermally stable POPs and EOCs is gas chromatography linked to mass spectrometry (GC-MS), which combines efficient GC separation with insightful MS detection. In this presentation role of GC-MS in the identification and analysis of organic pollutants is discussed.

Keywords: Biological degradation, POPs, EOCs, synthetic organic chemicals.

TITLE: Development and Standardization of Stability Indicating UV-Spectrophotometric method for Quantification of Tofisopam.

Authors: Snehal Tavade*, Nikhil S. Gawas, Meenaxi M. Maste, Shailendra S. Suryawanshi

*****-Presenting Author.

Subject Code: CHE

ABSTRACT

Introduction: Tofisopam has a unique CNS activity, also it enhances the anticonvulsant action of Diazepam and Muscimol. Tofisopam serves as an isoenzyme-selective inhibitor of phosphodiesterases (PDEs)

Method: UV-Spectrophotometric method was developed by using Methanol:Water (40:60%) as a solvent. The Developed method was validated in terms of specificity, selectivity, linear range, LOD, LOQ, precision, accuracy, robustness, ruggedness, and reproducibility, as per ICH guidelines The newly developed and validated method was successfully applied for the estimation of Tofisopam in pharmaceutical dosage forms. Stability studies were performed using acidic, basic, thermal, oxidative, and photolytic conditions.

Results: Tofisoapam exhibits λmax at 309nm. Beer's law was obeyed in the concentration range of 4-20µg/ml. The limit of detection and limit of quantification were found to 1.29µg/ml and 3.91µg/ml respectively. Recovery of Tofisopam was in the range of 101-108%. The percentage relative standard deviation was found to be less than 2% for all the precision and repeatability studies. The assay of Tofisopam was found to be 99-102%. On degradations studies, it was observted that 6-20% of the drug was degraded on exposure to Acidic, bacic, thermal, oxidation, and photolytic conditions.

Conclusion: The method was found to be, simple, specific, reproducible, economical, for routine analysis of Tofisopam in the bulk and pharmaceutical dosage form. 6-20% of the drug was degraded on force degradation.

COMPARATIVE STUDY OF NEW TRENDS IN HPLC

Saroj Choudhary,

M Pharmacy 1st Semester, Pharmaceutical Analysis,

G. Pulla Reddy College of Pharmacy, Hyderabad, Telangana, India – 500 028

ABSTRACT

Today, Chromatography is the backbone of separation science and is being used in all research laboratories and pharmaceutical industries of the world. Chromatographic process can be defined as separation technique involving mass-transfer between stationary phase and mobile phase. In these chromatography techniques, HPLC is one of the chromatographic techniques, which is mostly used analytical technique. In this method, stationary phase can be a liquid or a solid phase. HPLC utilizes a liquid mobile phase to separate the components of a mixture. Recent developments in chromatographic supports and instrumentation for liquid chromatography (LC) are enabling rapid and highly efficient separations. The new trends in HPLC are,

Rapid Resolution Liquid Chromatography (RRLC)

Ultra-Performance Liquid Chromatography (UPLC)

Ultra-Fast Liquid Chromatography (UFLC)

Nano Liquid Chromatography.

Depending on the nature, chemical structure, and molecular weight of the analysts, it is possible to select the type of HPLC.

Keywords: Liquid chromatography, HPLC, RRLC, UPLC, UFLC, Nano LC.

METHOD DEVELOPMENT AND VALIDATION OF MEROPENEM AND VABORBACTAM BY RP-HPLC METHOD

K.Shruthi, Srikalyani V, P.Sridevi, M.Bhagavan Raju
Dept. of Pharmaceutical Analysis, Sri Venkateshwara College of Pharmacy

Abstract

A new, rapid, economical and isocratic Reverse Phase High Performance Liquid Chromatography (RP-HPLC) method was developed for the simultaneous estimation of Meropenem, an intravenous β-lactam antibiotic used to treat a variety of bacterial infections and Vaborbactam an effective antibiotic by itself, it restores potency to existing antibiotics by inhibiting the β-lactamase enzymes in bulk drug substance and pharmaceutical dosage forms. The developed method was validated as per of ICH guidelines. The chromatographic separation was achieved isocratically on Inertsil ODS C_{18} column (250 x 4.60 mm i.d., 5 µM particle size) at ambient temperature using methanol (MeOH), and water as mobile phase at flow rate of 1 mL/min and UV detection at 252 nm. Meropenem and Vaborbactam exhibited linearity over the concentration range of 20-80 µg/mL (r^2=0.999) with LOD of 0.261 and 0.120 µg/mL respectively. The LOQ of 0.792 and 0.363 for Meropenem and Vaborbactam. The accuracy of the method was 99.0-100.0%. The intra-day and inter-day precision were found to be within limits. The method was successfully validated method with excellent selectivity, linearity, sensitivity, precision and accuracy was applicable for the assay of Meropenem and Vaborbactam in bulk drug substance and pharmaceutical dosage forms.

Keyword: Meropenem, Vaborbactam, RP-HPLC, ICH Guidelines

METHOD DEVELOPMENT AND VALIDATION OF BUPROPOIN AND ZONISAMIDE BY USING RP-HPLC METHOD

G.Sai Deekshitha, Srikalyani V, P.Sridevi, M.Bhagavan Raju
Dept. of Pharmaceutical Analysis, Sri Venkateshwara College of Pharmacy

Abstract

A new sensitive and rapid HPLC method was developed for the simultaneous determination of Bupropoin and Zonisamide in bulk and pharmaceutical dosage forms; it was validated according to ICH guidelines. The HPLC analysis was performed on the Waters HPLC system equipped with a Inertrsil ODS C18 (250 cm × 4.6 mm) 5 μm column, with a mixture of acetonitrile and water in the ratio of 40: 60 v/v as the mobile phase, at the flow rate of 1.0 mL/min. The detection was performed at the wavelength (λ) of 275nm, and the retention time The total run time was 10.0 min. The calibration plot gave linear relationship over the concentration range of 20-80μg/ml. The LOD and LOQ were 0.34 and 0.25 $\mu g/ml$, 1.05 and 0.77 $\mu g/ml$ respectively. The accuracy of the proposed method was determined by recovery studies and was found to be 100.3%. The repeatability testing for both standard and sample solutions showed that the method is precise within the acceptable limits. RSD% of the determination of precision was <2%. The results of robustness and solutions stability studies were within the acceptable limits as well. The proposed method showed excellent linearity, accuracy, precision, specificity, robustness, LOD, LOQ, and system suitability results within the acceptance criteria..

Keyword: Bupropoin, Zonisamide, RP-HPLC, ICH Guidelines, Validation

A MULTIVARIATE QUANTIFICATION OF BOX BEHNKEN DESIGN ASSISTED METHOD DEVELOPMENT AND VALIDATION OF DEXTROMETHORPHAN HYDROBROMIDE AND DESLORATADINE SIMULTANEOUSLY BY REVERSE PHASE HPLC IN IN-HOUSE SYRUP FORMULATION

MD. IRSHAD ALAM*,[1], AQUIL UR-RAHIM SIDDIQUI[2]

1) Research Scholar, Faculty of Science and Technology, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad, Maharashtra.
2) Research Guide, Faculty of Science and Technology, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad, Maharashtra, India.

ABSTRACT

An innovative HPLC assay method was developed and validated for quantification of Dextromethorphan hydrobromide and Desloratadine simultaneously in monophasic liquid formulation, by preparing syrup containing 30 mg/5 ml of Dextromethorphan hydrobromide and 1.2 mg/ml of Desloratadine. The chromatographic severance was executed by gradient solution A and B. The composition of buffer solution A contains 0.05 M monobasic potassium, then to it added 1 ml triethylamine and adjusted the pH to 2.3 with orthophosphoric acid, Methanol was used as Solution B. The gradient elution was executed with Kromasil C8 (250 mm x 4.6 mm) column having 1.5ml/min flow rate, 20µl injection volume with UV-estimation at 254 nm for Dextromethorphan hydrobromide and DES. The current research was planned according to Box-Behnken design by utilizing design expert software, using four factors such as column temperature (A), flow rate (B), mobile phase-organic phase (C) and pH (D), correspondingly the selected response variables were Resolution between A and B i.e. Desloratadine and methyl paraben (Y1), tailing of Dextromethorphan hydrobromide (Y2) and tailing of Desloratadine (Y3). The parameters like, system suitability, linearity, accuracy, precision, robustness, limit of detection, limit of quantitation and ruggedness were analyzed to validate the developed method in accordance with current regulatory guidelines.

Key Words: Box Behnken Design, Desloratadine, Dextromethorphan hydrobromide, Forced Degradation, Optimization techniques.

ANALYTICAL SOLUTIONS FOR FOOD CONTAMINANTS FROM FOOD CONTACT MATERIALS

Asma Begum
Department of Pharmaceutical Analysis
G. Pulla Reddy College of Pharmacy, Hyderabad, Telangana, India – 500 028
-PHARMACEUTICAL ANALYSIS

ABSTRACT:

Food is the basic human need to stay alive. Moreover, it is the need of every living organism. Food contact materials are everything that is in contact with food. Materials come in contact with food, such as packing and containers, kitchen equipment, and dishes. Materials are produced to accommodate the rise of our convenience food lifestyle. The article addresses the advanced analytical solutions for the analysis of the most common contaminants from food contact material. In recent years the need to explore more recycled materials and biodegradables for more eco-friendly and sustainable food packaging, new innovative materials, and composites have been introduced into the scene. The possible migration of extractable and leachable chemicals to food and potential toxicity to human health have raised several concerns. Therefore, overcoming the contamination of food from food contact materials, require analytical instruments for identifying the contaminants. Finally, we emphasize the importance of analytical solutions to eliminate the contamination or degradation of food.

Keywords: Analytical Solutions, Extractable, Leachable, Recycled Materials, Biodegradables.

STABILITY INDICATING RP-HPLC METHOD FOR THE ESTIMATION OF ASPIRIN AND TICLOPIDINE IN COMBINED DOSAGE FORM

Rayeesa Seema, Srikalyani V, P.Sridevi, M.Bhagavan Raju
Dept. of Pharmaceutical Analysis, Sri Venkateshwara College of Pharmacy

Abstract

A simple, accurate, precise, reproducible stability indicating Reverse Phase High Performance Liquid Chromatography (RP-HPLC) method was developed and validated for the estimation of Aspirin and Ticlopidine in Combined dosage form. Chromatographic separation was done by using Xterra column having dimension of (4.6*150mm, 5µ). Mobile phase containing 70% buffer and 30% methanol was pumped through column at a flow rate of 1.0 mL per minute. Buffer 3.4 g of KH_2Po_4 was taken in 1000 mL water pH adjusted with NaOH. Temperature was maintained ambient. Optimized wavelength for Aspirin and Ticlopidine was 210 nm. % RSD of the Aspirin and Ticlopidine were found to be 0.8 and 0.4 respectively. LOD and LOQ values obtained from regression equation of Aspirin and Ticlopidine were 3.02, 3.00 and 9.98 and 10.00 respectively. Proposed method has been validated for accuracy, precision, linearity, robustness and range was within the acceptance criteria according to ICH guidelines Q2 (R1). Aspirin and Ticlopidine were subjected to stress conditions like acidic, alkaline, oxidation, photolysis and the degradation. Hence the enveloped method can be successfully employed for the routine analysis of Aspirin and Ticlopidine in combined dosage forms.

KEY WORDS: Aspirin, Ticlopidine, RP-HPLC, Method Validation

SOUVENIR 2025 (PHARMACEUTICAL ANALYSIS)

Analytical method development and validation of Amivantamab by RP-HPLC and forced degradation studies ***D.Sushma reddy, R.Devika, R.Mrudhula, R.Gayathri Department of Pharmaceutical analysis, Mallareddy Institute of pharmaceutical sciences, Maisammaguda,Dhulapally, Kompally post, Secunderabad-500100 E-Mail: devika672003@gmail.com**

Amivantamab is a Bispecific antibody (BsAbs) that target the mesenchymal-epithelial transition factor (MET) and epidermal growth factor receptor (EGFR) pathways offer a potential option to treat patients with non-small cell lung cancer who are resistant to targeted therapy. In order to find the best bispecific molecule, we used a combinatorial method to screen a panel of BsAbs one after the other. Different EGFR and MET parental monoclonal antibodies were used to create the BsAbs. Initially, compounds were screened for lack of agonistic action toward MET and EGFR and MET binding to tumor cell lines. Hydrophobicity is the basis for separating molecules in reversed-phase high-performance liquid chromatography (RP-HPLC) where amivantamab is analyzed. The solute molecule from the mobile phase must hydrophobically bond to the immobilized hydrophobic ligands that are connected to the stationary phase, or the sorbent, in order for the separation to occurred MET binding to tumor cell lines. The method development and validation of amivantamab is performed Chromatographically. The drug is validated using characteristics such as accuracy, precision, linearity, robustness, ruggedness, forced degradation tests, LOD, and LOQ. In the HCC827-HGF in vivo model, amivantamab exhibited better anticancer effect than small molecule EGFR and MET inhibitors. Patients with cancers linked to abnormal EGFR and MET signaling may benefit from amivantamab due to its distinct method of action. Keywords: Mesenchymal-epithelial transition factor(MET), Epidermal growth factor receptor(EGFR), Limit of Detection(LOD), Limit of Quantification(LOQ), RP-HPLC.

METHOD DEVELOPMENT AND METHOD VALIDATION FOR SIMULTANEOUS ESTIMATION OF LENACAPAVIR –BICTEGRAVIR USING RP-HPLC METHOD.

Revathi B.*, Gowthami B., Harini D., Sravya G. V. and Varsha M.

Department of Pharmaceutical Analysis, Malla Reddy Institute of Pharmaceutical Sciences Maisammaguda, Secunderabad -500100.

E-mail:mvarshaguptha2003@gmail.com

ABSTRACT: A simple, Accurate, precise method was developed for the simultaneous estimation of the Bictegravir and Lenacapavir in dosage form. Chromatogram was run through BDS C18 150 x 4.6mm, 5.0µm. Mobile phase containing Acetonitrile: Buffer 0.01N KH_2PO_4 taken in the ratio 60:40v/v was pumped through column at a flow rate of 1.0 ml/min. Temperature was maintained at 30°C. Optimized wavelength selected was 257 nm. Retention time of Bictegravir and Lenacapavir were found to be 2.368 min and 3.052 min. %RSD of standard the Bictegravir and Lenacapavir were and found to be 0.4 and 0.4 respectively. %Recovery was obtained as 99.39% and 99.15% for Bictegravir and Lenacapavir respectively. LOD, LOQ values obtained from regression equations of Bictegravir and Lenacapavir were 0.45, 1.38 and 0.05, 0.15 respectively. Regression equation of Bictegravir is y = 8138.7x + 1020.8 and y = 5547.7x + 352.73 of Lenacapavir Retention times were decreased and that run time was decreased, so the method developed was simple and economical that can be adopted in regular Quality control test in Industries.

Key Words: *Bictegravir, Lenacapavir, RP-HPLC, Method Development, Validation.*

REAL-TIME ANALYSIS WITH LASER-INDUCED BREAKDOWN SPECTROSCOPY – A REVIEW

A. Kavya, Harshita Padhi, B. Vineela, S. Marakatham*

Malla Reddy Institute of Pharmaceutical Sciences, Maisammaguda, Dhulapally Post via Kompally, Secunderabad – 500100.

ABSTRACT: Laser-Induced Breakdown Spectroscopy (LIBS) is a versatile, real-time analytical technique used for rapid elemental analysis of various sample types, including solids, liquids, and gases. Its ability to provide multi-element detection with minimal sample preparation has led to its adoption across numerous scientific and industrial fields. This review highlights the key principles of LIBS, its instrumental setup, and diverse application areas. In environmental monitoring, LIBS is used for detecting toxic metals in soil, water, and off-gas emissions. Industrial applications benefit from LIBS in process control, particularly in hazardous conditions. In the biomedical domain, LIBS enables fast analysis of biological tissues, aiding in disease diagnosis and health monitoring. Forensic science uses LIBS for trace evidence analysis. LIBS also play a critical role in space and geological research, supporting planetary exploration and mineral identification. Furthermore, LIBS is valuable in agriculture, food safety, veterinary science, and archaeology. Techniques like adsorption, Pelletization, and micro-extraction enhance its sensitivity and minimize matrix effects. The growing integration of LIBS with automation and machine learning continues to expand its capabilities and precision in both qualitative and quantitative analysis.

Keywords: LIBS, Environmental Monitoring, Biomedical Applications, Forensic Analysis, Industrial Process Control.

ANALYTICAL METHOD DEVELOPMENT AND VALIDATION OF ANTIDIABETICS IN PHARMACEUTICAL DOSAGE FORM BY USING RP-HPLC METHOD

Dr. Meruva Sathish Kumar

M.N.R College of Pharmacy, Fasalwadi, and Sangareddy: 502294

ABSTRACT

An accurate, precise, simple, efficient and reproducible, isocratic Reversed PhaseHigh Performance Liquid Chromatography (RP-HPLC) method was developed and validated for the simultaneous estimation of Metformin and Nateglinide in bulk and combined pharmaceutical tablet dosage forms. Metformin and Nateglinide were separated by using a Symmetry ODS C18 (4.6mm×150mm) 5µm Particle Size, Waters Alliance e2695 HPLC system with 2998 PDA detector and the mobile phase contained a mixture of Methanol: 0.1% Orthophosphoric acid (64:36% v/v). The flow rate was set to 1ml/min with the responses measured at 224nm. The retention time of Metformin and Nateglinide was found to be 2.808min and 3.880min respectively with resolution of 5.68. Linearity was established for Metformin and Nateglinide in the range of 20-100µg/ml for Metformin and 60-140µg/ml for Nateglinide with correlation coefficient 0.999. The percentage recovery was found to be is 100.30% for Metformin and 100.21% for Nateglinide respectively. Validation parameters such as specificity, linearity, precision, accuracy and robustness, limit of detection (LOD) and limit of quantitation (LOQ) were evaluated for the method according to the International Conference on Harmonization (ICH) Q2 R1 guidelines. The developed method was successfully applied for the quantification of bulk and active pharmaceutical ingredient present and in combined tablet dosage form.

Keywords: Metformin and Nateglinide, RP-HPLC, Validation, Accuracy, Robustness..

TITLE : **EMERGING TRENDS IN PHARMACEUTICAL ANALYSIS**

Dr R V Valli Kumari, Dr B Raj Kamal, K.Harshitha*, M.Suresh, K.Karthik, D.Jashwanth

Department of Pharmaceutical Analysis, Malla Reddy Institute of Pharmaceutical Sciences.

6303761083, karupothulaharshitha@gmail.com

Maisammaguda, Dhulapally, Post Via Kompally Secundrabad-500100

ABSTRACT :

The advancement of pharmaceuticals has transformed human health; however, their effectiveness is contingent upon being devoid of impurities and administered in appropriate dosages. Pharmaceutical analysis plays a crucial role in guaranteeing the quality, efficacy, and safety of these products. Recent innovations in nanotechnology, green analytical chemistry, and artificial intelligence (AI) are significantly improving the accuracy and efficiency of pharmaceutical analysis. To ensure that medications achieve their intended effects, a variety of chemical and instrumental techniques have been developed over time for drug quantification. Pharmaceuticals may acquire impurities during their development, transportation, and storage, which can pose risks if not adequately analyzed. Consequently, analytical instruments and methodologies are vital for the detection and quantification of these impurities. This review emphasizes the significance of analytical instruments and methods in assessing drug quality. It encompasses a wide array of analytical techniques, including titrimetric, chromatographic, spectroscopic, electrophoretic, and electrochemical methods, all utilized in pharmaceutical analysis. Additionally, the review addresses current trends, their applications, and potential future developments in the field.

NEW METHOD DEVELOPMENT AND VALIDATION OF CEFEPIME AND ENMETAZOBACTAM USING RP-HPLC IN BULK FORM

Indraja. N*, Venu. N, Vamsi, R, Shyam. T, Sandeep. V

Department of Pharmaceutical Analysis, Malla Reddy Institute of Pharmaceutical Sciences, Maisammaguda, Dhulapally-500100.

Email: indraja.nemallapudi@gmail.com

ABSTRACT:

A novel, stability-indicating RP-HPLC method was developed and validated for the simultaneous determination of Cefepime and Enmetazobactam in pharmaceutical formulations. Chromatographic separation was achieved on a Discovery and Kromasil C-18 column using a binary mobile phase consisting of methanol (pH 6.2) and acetonitrile (45:55, v/v) at a flow rate of 1 mL/min. Detection was performed at 210 nm. The method was linear over the concentration range of 4-24 µg/mL (r2 = 0.9977) for Cefepime and 0.5-3.0 µg/mL (r2 = 0.9974) for Enmetazobactam. The method was validated according to ICH Q2 (R1) guidelines and demonstrated excellent precision, accuracy, sensitivity, and robustness. The percentage content found for Cefepime and Enmetazobactam in pharmaceutical formulations was 101.12 ± 0.49 and 101.33 ± 1.17, respectively. Forced degradation studies were performed to evaluate the specificity of the method. A precise method was developed that can be used for routine analysis, stability studies and quality control.

KEY WORDS: Cefepime, enmetazobactam, RP-HPLC, Chromatogram, Quality control,

Stability, etc.

Method Development and Validation for Simultaneous Estimation of Catechin, Rutin and Silymarin in Pure Form by Using RP-HPLC Method.

Samiksha.M, Geetha.J, Karthik.G, Sangeetha Jayaraman*

Department of Pharmacognosy, Malla Reddy Institute of Pharmaceutical Sciences Maisammaguda, Secunderabad -500100.

E-mail:samikshagoud1438@gmail.com

ABSTRACT: This study presents the development and validation of a precise, accurate, and robust Reverse Phase High-Performance Liquid Chromatography (RP-HPLC) method for the simultaneous estimation of antioxidant flavonoids in pure form . These compounds are widely used for their hepatoprotective and antioxidant properties. Chromatographic separation was achieved using an Intersil C18 column (4.6 × 250 mm, 5 µm) with a mobile phase consisting of Orthophosphoric acid buffer and Acetonitrile in a 60:40 v/v ratio. The flow rate was maintained at 1.0 mL/min, the detection wavelength was set at 228 nm, and the column temperature was kept at 30°C. The method was validated as per ICH guidelines for parameters including specificity, linearity, accuracy, precision (intra-day and inter-day), limit of detection (LOD), limit of quantitation (LOQ), robustness, and system suitability. The method demonstrated excellent linearity for all three compounds ($R^2 > 0.999$), with %RSD values under 2%, confirming its precision. Forced degradation studies confirmed the stability-indicating capability of the method under various stress conditions including acid, base, oxidative, thermal, and photolytic degradation. The method was found to be simple, reliable, and reproducible, and is suitable for routine quality control analysis of pure form in pharmaceutical preparations.

Keywords: *Antioxidant Flavonoids, Hepatoprotective, Method Validation, RP-HPLC, Stability-Indicating.*

Poster Presentation

HERBAL BASED NANOTECHNOLOGY FOR ANTIDIABETIC THERAPY - A REVIEW

Preethy Ani Jose[*1], V. Alagarsamy[1], S. Gopinath[2]

1 MNR College of Pharmacy, Sangareddy, Telangana - 502294

2 Faculty of Pharmacy, Sri Ramachandra Institute of Higher Education and Research (DU), Chennai

* corresponding/presenting author - contact number: 9742477135

preethyani@hotmail.com

ABSTRACT

Nanotechnology has made its mark in numerous sectors of science and technology leading to technological breakthrough due to their unique characteristics and superior performances. Nanoparticles have shown great potential for targeted delivery of drugs for the treatment of several diseases.

Diabetes mellitus requires continuing medical care and patient self-management of the disease to prevent acute complications and reduce the risk of long-term complications. Herbal drugs are prescribed widely because of their effectiveness, less side effects and relatively low cost.

Phytotherapeutics needs a scientific approach to deliver the herbal drugs in a sustained manner to increase patient compliance and avoid repeated administration, which can be achieved by designing novel drug delivery system. Nanotechnology is one such approach that helps to increase the therapeutic value by reducing toxicity and increasing the bio-availability besides reducing repeated doses.

different plants or their active principles have been nanosynthesised for treatment of type 2 diabetes. 'Herbal remedy' in the nanocarriers will increase its potential for the treatment of various chronic diseases and health benefits. With the increasing population of diabetics,

improved resources are needed to sustain society and this could be achieved through nanoscience and technology.

KEYWORDS: nanotechnology, diabetes mellitus, herbal drugs, phytotherapy, nanocarriers

ABSTRACT

The plant materials such as Gymnema Sylvestre (Leaves),Trigonella Foenum-Gr (Leaves), Tinospora Cardifolia (Stems), Azadirachata Indica (Leaves), Cinnamomum Zeylanicum (Barks), Syzygium Jambolana (Fruits) & Nardostachys jatamansi (Roots) are well-known plants available throughout India and they are commonly used for the treatment of various diseases including diabetes mellitus. The antidiabetic activity of the individual plant parts is well known, but the synergistic or combined effects are unclear. The concept of polyherbalism has been highlighted in Sharangdhar Samhita, an Ayurvedic literature dating back to 1300 AD. Polyherbal formulations enhance the therapeutic action and reduce the concentrations of single herbs, thereby reducing adverse events. The aim of the present study is to formulate a polyherbal formulation and evaluate its antidiabetic potential in animals. The polyherbal formulation was formulated using the ethanolic extracts of the Gymnema Sylvestre (Leaves),Trigonella Foenum-Gr (Leaves), Tinospora Cardifolia (Stems), Azadirachata Indica (Leaves), Cinnamomum Zeylanicum (Barks), Syzygium Jambolana (Fruits) & Nardostachys jatamansi (Roots). The quality of the finished product was evaluated as per the World Health Organization's guidelines for the quality control of herbal materials. The quality testing parameters of the polyherbal formulation were within the limits. The acute toxicity studies of the polyherbal formulation did not show any toxic symptoms in doses up to 5000 mg/kg bw over 14 days. The oral antidiabetic activity of the Ethanolic Extract of Polyherbal Formulation (EEPF) at 200, 300,400 and 500 mg/kg bw was screened against streptozotocin (55 mg/kg; i.p.) induced diabetes mellitus in rats. The investigational drug was administered for 21 consecutive days, and the effect of the polyherbal formulation on blood glucose levels was studied at regular intervals. At the end of the study, the blood samples were collected from all the animals for biochemical estimation, and the animals were sacrificed and the liver and pancreatic tissues were collected for histopathologic analysis. Polyherbal formulation showed significant antidiabetic activity at 400 and 500 mg/kg, respectively, and this effect was comparable with that of glibenclamide. The antidiabetic activity of polyherbal formulation is supported by biochemical and histopathologic analysis.

Key words: Polyherbal, Antidiabetic, Streptozotocin, Ethanol etc

MRIPS JOURNAL

High Performance Liquid Chromatography- A Short Review

Deepika Bindu B*, Dimpu Sai Vinusha D, Nagavamshi G and Harish D.

Department of Pharmaceutical Analysis, Malla Reddy Institute of Pharmaceutical Sciences, Secundrabad.

*Corresponding author e-mail: burjukindideepikabindu@gmail.com

ABSTRACT

High performance liquid chromatography (HPLC) is an important qualitative technique, generally used for the estimation of pharmaceutical and biological samples. It is the most versatile and safest, dependable and fastest chromatographic technique for the quality control of drug compound. The HPLC principle is based on the distribution of the components between a stationary phase (HPLC column) and a mobile phase (solvent). Depending on the chemical structure of the molecule they are retarded as passing the stationary phase. Between 1941 and 1960, scientists predicted that the liquid chromatography could be operated with high efficiency by reducing the column packing particle size to around 150 μm and flowing the mobile phase at increased velocity. As a result, in the 1970s, many developments were seen around instrumentation and hardware. HPLC analyzes fall into four different categories: Reverse phase, normal phase, size-exclusion method and ion exchange method. The instrumentation includes solvent reservoir, pump, sample injector, micro bore segment, detector, data collection device and integrator. Validation is the process of establishing the performance characteristics and limitations of a method and identification of the influences which may change these characteristics and to what extent. The various validation parameters are Accuracy, Precision, Repeatability, Linearity, Detection limit, Quantitation limit, Specificity, Range and Robustness.

Keywords: Normal phase chromatography, Instrumentation and Validation.

"NATURE TO NEW": SPONDIAS PINNATA LEAVES GREEN ENGINEERED SILVER NANOPARTICLES AS POTENTIAL ANTICANCER AGENTS & ANALYTICAL FINGERPRINTING STUDIES – AN ECOFRIENDLY APPROACH FOR NATURAL PRODUCTS DRUG DISCOVERY

V Arun Reddy[1*], V Narmada[2*]

[1*] *Department of Pharmacy, Pharmaceutical Analysis & QA, University College of Technology(A), Osmania University, Tarnaka, Hyd-500 007, TS, India*

[2*] *Assistant Professor, Department of Pharmacy, University College of Technology(A), Osmania University, Tarnaka, Hyd-500 007, TS, India*

*E-mail: ArunOUPharma939@gmail.com

Abstract

Introduction: WHO estimates that 80% of the world populations currently use herbal drugs for major health care. Fingerprinting is a process that determines the concentrations of a set of characteristic chemical substances in an herb. Knowing the relative concentrations is a means of assuring the quality of herbal preparations. It can serve as a tool for identification, authentication and quality control of herbal drugs. Nanotechnology has changed the outlook of researchers towards science and technology. The enhanced surface area of the particles due to their nano size is contributing to the wide range of applications are used.

Background: No reports on synthesis of silver nanoparticles and Isolation.

Materials and Methods: Biosynthesis of silver nanoparticles was done by hot plate method and synthesized silver nanoparticles are characterized by SEM, TEM, XRD, Nanoparticle analyzer, FTIR and UV (Size and morphology, crystalline nature & size , zeta potential & charge, Functional groups and confirmation of synthesis of silver nanoparticles) respectively.

Extraction by soxhelt apparatus and column chromatography for isolation of compounds. GC-MS analysis of extracts. Structure elucidation was confirmed by IR,NMR ,MASS spectra's. Anticancer activity was performed on MCF7 cells by In-vitro (MTT Assay).

Results: β-sitosterol was isolated from n-hexane fraction and GC-MS analysis shows the new components present in spondias pinnata. Preliminary confirmation from UV-Visible peak around 424 nm , SEM(50nm), TEM(Spherical), XRD(22.5nm), zeta potential(-21.2mV & -ve charge) and FTIR(C-H,O-H,C=C stretching and bending of alkane, alkene and aromatic groups of lipds proteins,etc)

Anticancer activity IC50 value was 58.41$\pm$0.864 more than standard drug (IC50 is 6.36$\pm$0.317.

Conclusion: An eco-friendly, rapid & convenient method was reported for synthesis of silver nanoparticles. β-sitosterol was isolated .Anticancer activity was more than the standard anticancer drug.

TITLE: Area Under Curve and Zero order UV-Spectroscopic Methods for the estimation of Chrysin in Bulk and Dosage form: Development and Validation.

Authors: Sushmita Hiremath*, Mahesh Palled, Akanksha Bhatkhande, Kiran Patil, Shailendra Suryawanshi.

***-Presenting Author.

Subject Code: CHE

ABSTRACT

Introduction: Chrysin is an oral antihistamine used to treat itchy skin rashes, urticaria, and allergic responses. It is crucial to develop suitable analytical methods for the evaluation of Chrysin in order to provide more selective, sensitive, and quick assay methods than those previously reported. The creation and validation of an ICH-compliant stability-indicating UV-Spectroscopic method was the main objective of this research.

Method: The mobile phase for the UV Spectroscopic technique was a mixture of water and methanol in a 60:40 v/v ratio. The wavelength of chromatin absorption was determined to be 269 nm.

Results: The linearity of chrysin ranged from 2 to 10 g/ml. Chrysin showed a 0.9997 regression coefficient for the absorbance and area under curve. %RSD that was less than 2 for both absorbance and area under curve for the parameters of precision (intraday and interday), ruggedness and robustness. Chrysin drug purity was found to be between 96 and 106%.

Conclusion: The UV methodology was more accurate, sensitive, and cost-effective than the previously developed UV-Spectroscopy method due to its quicker action. At 269nm, UV detection was accomplished respectively. The same lamda max was used for an assay as well. The evaluation of Chrysin was found to be appropriate for the approach created for UV Spectroscopy. The established UV-Spectroscopy approach for routinely analysing the medication Chrysin is accurate, linear, precise, simple, and robust.

FDA’s new pharmaceutical quality initiative: Knowledge-aided assessment & structured applications

Rutuja Hasure, M Pharmacy 1st semester,

Regulatory Affairs, G Pulla Reddy College of Pharmacy, Mehdipatnam.

Subject Code: PRA

Abstract

The FDA‟s new pharmaceutical quality initiative: Knowledge-aided assessment & structured applications (KASA). The aim of USFDA is Timely development, assessment, and approval of safe and effective drugs is pivotal for assuring the American public has access to quality medicines. At present, the new drug and generic quality assessment is performed using a written narrative. To modernize the assessment of drug applications, a KASA system has been initiated. KASA could become a system that captures and manages information about a drug product including risk identification, mitigation and communication, and control strategy. It does this through a structured IT framework that could completely replace the current unstructured text-based, narrative assessment.

Keywords: Knowledge-aided assessment & structured applications (KASA), USFDA, Office of Pharmaceutical Quality (OPQ), failure mode, effects and criticality analysis (FMECA)

Poster Presentation

HERBAL BASED NANOTECHNOLOGY FOR ANTIDIABETIC THERAPY - A REVIEW

Preethy Ani Jose[*1], V. Alagarsamy[1], S. Gopinath[2]

1 MNR College of Pharmacy, Sangareddy, Telangana - 502294

2 Faculty of Pharmacy, Sri Ramachandra Institute of Higher Education and Research (DU), Chennai

* corresponding/presenting author - contact number: 9742477135

preethyani@hotmail.com

ABSTRACT

Nanotechnology has made its mark in numerous sectors of science and technology leading to technological breakthrough due to their unique characteristics and superior performances. Nanoparticles have shown great potential for targeted delivery of drugs for the treatment of several diseases.

Diabetes mellitus requires continuing medical care and patient self-management of the disease to prevent acute complications and reduce the risk of long-term complications. Herbal drugs are prescribed widely because of their effectiveness, less side effects and relatively low cost.

Phytotherapeutics needs a scientific approach to deliver the herbal drugs in a sustained manner to increase patient compliance and avoid repeated administration, which can be achieved by designing novel drug delivery system. Nanotechnology is one such approach that helps to increase the therapeutic value by reducing toxicity and increasing the bio-availability besides reducing repeated doses.

different plants or their active principles have been nanosynthesised for treatment of type 2 diabetes. ‘Herbal remedy’ in the nanocarriers will increase its potential for the treatment of various chronic diseases and health benefits. With the increasing population of diabetics, improved resources are needed to sustain society and this could be achieved through nanoscience and technology.

KEYWORDS: nanotechnology, diabetes mellitus, herbal drugs, phytotherapy, nanocarriers

ABSTRACT

The plant materials such as Gymnema Sylvestre (Leaves),Trigonella Foenum-Gr (Leaves), Tinospora Cardifolia (Stems), Azadirachata Indica (Leaves), Cinnamomum Zeylanicum (Barks), Syzygium Jambolana (Fruits) & Nardostachys jatamansi (Roots) are well-known plants available throughout India and they are commonly used for the treatment of various diseases including diabetes mellitus. The antidiabetic activity of the individual plant parts is well known, but the synergistic or combined effects are unclear. The concept of polyherbalism has been highlighted in Sharangdhar Samhita, an Ayurvedic literature dating back to 1300 AD. Polyherbal formulations enhance the therapeutic action and reduce the concentrations of single herbs, thereby reducing adverse events. The aim of the present study is to formulate a polyherbal formulation and evaluate its antidiabetic potential in animals. The polyherbal formulation was formulated using the ethanolic extracts of the Gymnema Sylvestre (Leaves),Trigonella Foenum-Gr (Leaves), Tinospora Cardifolia (Stems), Azadirachata Indica (Leaves), Cinnamomum Zeylanicum (Barks), Syzygium Jambolana (Fruits) & Nardostachys jatamansi (Roots). The quality of the finished product was evaluated as per the World Health Organization's guidelines for the quality control of herbal materials. The quality testing parameters of the polyherbal formulation were within the limits. The acute toxicity studies of the polyherbal formulation did not show any toxic symptoms in doses up to 5000 mg/kg bw over 14 days. The oral antidiabetic activity of the Ethanolic Extract of Polyherbal Formulation (EEPF) at 200, 300,400 and 500 mg/kg bw was screened against streptozotocin (55 mg/kg; i.p.) induced diabetes mellitus in rats. The investigational drug was administered for 21 consecutive days, and the effect of the polyherbal formulation on blood glucose levels was studied at regular intervals. At the end of the study, the blood samples were collected from all the animals for biochemical estimation, and the animals were sacrificed and the liver and pancreatic tissues were collected for histopathologic analysis. Polyherbal formulation showed significant antidiabetic activity at 400 and 500 mg/kg, respectively, and this effect was comparable with that of glibenclamide. The antidiabetic activity of polyherbal formulation is supported by biochemical and histopathologic analysis.

Key words: Polyherbal, Antidiabetic, Streptozotocin, Ethanol etc

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1.	Aymen Fatima	FORMULATION AND IN-VITRO EVALUATION OF CLOPIDOGREL BISULPHATE NANOSUSPENSION USING BOX-BEHNKEN DESIGN	G.Pulla Reddy Pharmacy	CEU/101/P
2.	Aashrith Reddy B*	Niosomes: Novel drug delivery system	GITAM School of Pharmacy	CEU/102/P
3.	S. JYOTHI REDDY, ASWATHY SUNIL	DNA CHIPS IN DIAGNOSING INFECTIOUS DISEASES	G. PULLA REDDY COLLEGE OF PHARMACY	CEU/103/P
4.	UDAY KIRAN VAKITI, PRANEETH BYRU	NOVEL TREATMENT METHODS FOR RARE DISEASES	G PULLA REDDY COLLEGE OF PHARMACY	CEU/104/P
5.	N. GAYATHRI REDDY	CRISPR TECHNOLOGY IN GENE EDITING	MallaReddy institution of pharmaceutical science	CEU/105/P
6.	1.KavyaAnnepaka 2.Varsha Madhamshetty 3.Harini Domakonda 4.Samiksha Mallagoni.	SUPPOSITORIES	MALLA REDDY INSTITUTE OF PHARMACEUTICAL SCIENCES	CEU/106/P
7.	1.Ch. Nagmani, 2. D. Sangeetha, 3. B. Sravani, 4.p. Harshita,	POLYMORPHISM AND POLYMORPH CHARACTERISATION IN	MALLA REDDY INSTITUTE OF PHARMACEUTICAL SCIENCES,	CEU/107/P
8.	Durga Bhavani.D, Akanksha.K ,Swetha.M, Vaishnavi.E,	SUSTAINED RELEASE DRUG DELIVERY SYSTEM	MALLA REDDY INSTITUTE OF PHARMACEUTICAL SCIENCES	CEU/108/P

9.	BandamAsmitha	GASTRO RETENTIVE DRUG DELIVERY SYSTEM	MALLA REDDY INSTITUTE OF PHARMACEUTICAL SCIENCES	CEU/109/P
10.	Preethy Ani Jose , V. Alagarsamy , S. Gopinath	HERBAL BASED NANOTECHNOLOGY FOR ANTIDIABETIC THERAPY	MNR College of Pharmacy	CEU/110/P
11.	AddankiAnusha, D.Ruthisha, B.Sanjeev, G.Kavitha	**TRANSDERMAL DRUG DELIVERY SYSTEM**	Malla Reddy Institute of pharmaceutical sciences	CEU/111/P
12.	**Kyathi K**	Nano-technology-based approaches for treating lysosomal storage disorders.	GITAM School of Pharmacy	CEU/112/P
13.	Dr. P. Srikanth Reddy	FORMULATION AND IN VITRO EVALUATION OF HYDROGELS CONTAINING AN ANTI-HYPERTENSIVE DRUG AS SUSTAINED DRUG DELIVERY SYSTEM	**MNR College of Pharmacy,**	CEU/01/O
14.	**Dr.P. Subhash Chandra Bose**	FORM,ULATION AND EVALUATION OF ANDLANSOPRAZOLE MICRO SPONGES	, **MNR College of Pharmacy,**	CEU/02/O

15.	**DamineniSaritha**	FORMULATION AND EVALUATION OF BILAYER MATRIX TABLET CONTAINING FAMOTIDINE AND KETOROLAC TROMETHAMINE	**Sultan-ul-Uloom College of Pharmacy,**	CEU/03/O
16.	**Dr. P. PhaniDeepika**	**BIOREMEDIATIONOF PLASTIC BY PETase ENZYME FROM GENETICALLY ENGINEERED MICRORGANISMS**	**MNR college of Pharmacy**	CEU/04/O
17.	SALAPAKA VENKATA PHANI RAHUL	DEVELOPMENT AND EVALUATION OF SOLID LIPIDNONOPARTICLES LOADED HYDROGELS FOR DERMATOLOGICAL APPLICATIONS	CAREER POINT UNIVERSITY	CEU/06/O
18.	D.R.ArunaKumari,	**Formulation and Evaluation of Lamotrigine intra nasal in-situ gel using central composite design**	SRI PADMAVATI MAHILA VISWAVIDYALAYAM	CEU/07/O
19	Ch.Alekya, *K.Vijaya Lakshmi, K.Vijayasri, M.Sudhakar	FORMULATION AND EVALUATION OF QUERCETIN LOADED IRON OXIDE NANOPARTICLES	Malla Reddy College of Pharmacy	CEU/08/O

Abstract Code: CEU/01/O

FORMULATION AND IN VITRO EVALUATION OF HYDROGELS CONTAINING AN ANTI-HYPERTENSIVE DRUG AS SUSTAINED DRUG DELIVERY SYSTEM

Dr. P. Srikanth Reddy

Professor, Department of Pharmaceutics, MNR College of Pharmacy, Sangareddy, 5022294.

E MAIL ID : srikanthreddyporeddy@gmail.com

ABSTRACT

In the present study Metoprolol tartarate hydrogels using Gelatin and Polyvinyl alcohol(PVA) was prepared for the controlled release of metoprolol. The hydrogels were synthesized by free radical polymerisation technique. Glutaraldehyde was used for cross linking of polyvinyl alcohol and gelatin to form IPN. Ten formulations were prepared by varying the concentration of polymers and cross linking agents in order to study the swelling and in vitro drug release profiles. The compatability of drug with the polymers was confirmed by fourier transform infrared spectroscopy (FT-IR) and differential scanning calorimetry (DSC). The x-ray difraction (XRD) studies were carried out to check the nature of the drug in the hydrogels formulations. The IPN hydrogels swelled in alkaline pH and swelling was minimal in acidic pH. It was found that as the concentration of cross linking agents were decreased, there was a increase in swelling. The priliminary results suggest that polyvinyl alcohol and gelatin IPN hydrogels can be used for the pH sensitive sustained release drug delivery of metoprolol tartarate.

KEYWORDS: Metoprolol tartarate, Hydrogels, Gelatin. Polyvinyl alcohol, IPN, Glutaraldehyde.

Abstract Code: CEU/02/O

Formulation and Evaluation of Lansoprazole micro sponges

Dr.P. Subhash Chandra Bose

Professor, Department of Pharmaceutics, MNR College of Pharmacy, Sangareddy, 5022294.

E MAIL ID : penjurisubhash@gmail.com

ABSTRACT

To convey their payload, microsponges are homogeneous, spherical, porous polymeric microspheres with a plethora of interconnected spaces in the particle size range of 5-300m. The active medicine is stored in minute sponge-like microspheres, typically 25 m in diameter5, implanted in the vehicle until the drug is activated by contact with the skin. The micropores inside the spheres have a pore density of around 1ml/g and a pore length of about 10ft, allowing for very high drug retention. Twelve different Lansoprazole microsponge formulations were developed for this study, each utilising a different polymer (including CAP, HPMCP, Eudragit L-100, and Cellulose acetate). Studies were conducted before mass medication production began. Microsponges derived characteristics were evaluated, including their bulk density, angle of repose, Carr's index, true density, and Hauser's ratio. It was determined how to make microsponges out of Lansoprazole and tested them. As evidenced by the technique's greater percentage yield, the Quasi emulsion solvent diffusion method was used effectively to create Lansoprazole microsponges.

Abstract Code: CEU/03/O

FORMULATION AND EVALUATION OF BILAYER MATRIX TABLET CONTAINING FAMOTIDINE AND KETOROLAC TROMETHAMINE

Damineni Saritha

Department of Pharmaceutics, Sultan-ul-Uloom College of Pharmacy, Hyderabad

E MAIL ID : penjurisubhash@gmail.com

ABSTRACT

Planning bilayer gastric drifting tablets (BLCR) containing ketorolac trimethamine and Famotidine HCl is proposed for the ongoing examination. Bardhan et al's. prior research, contrasted with ketorolac trimethamine monotherapy, co-remedy of ketorolac trimethamine with Famotidine essentially expanded the H pylori destruction rate1. The point of this study is to expand ketorolac trimethamine's bioavailability and restorative viability when utilized related to Famotidine HCl2-4, a H2 blocker.

Bilayer gastric drifting tablets, another period for the fruitful improvement of controlled discharge detailing with different highlights to give a technique for effective medication conveyance framework over regular tablets5, may accomplish the goal. Bilayer gastric drifting tablets are appropriate for the consecutive arrival of two medications in blend, as well as the partition of two substances that are contrary with each other. They can likewise be utilized for supported discharge tablets, with one layer filling in as the underlying portion for sure fire discharge and the subsequent layer filling in as the upkeep portion. While the supported delivery ketorolac trimethamine layer conveys Famotidine HCl in a supported way for a lengthy timeframe to diminish measurement, the quick delivery layer contains super disintegrants, which advance the pace of medication discharge and speed up the beginning of activity. The arranged bilayer gastric drifting tablets utilized in this study contained a layer with a quick arrival of Famotidine HCl that was intended to convey Famotidine HCl to smother overabundance corrosive discharge and a layer with a controlled arrival of ketorolac trimethamine that was intended to convey ketorolac trimethamine to the stomach and help to control H. pylori limited in the mucosal coating of the stomach.

Abstract Code: CEU/04/O

BIOREMEDIATION OF PLASTIC BY PETase ENZYME FROM GENETICALLY ENGINEERED MICRORGANISMS

Dr. P. Phani Deepika

Associate Professor, Department of Biotechnology, MNR college of Pharmacy, Sanga Reddy

E MAIL ID : deepika.phani@gmail.com

ABSTRACT

Plastics are widely used in global economy. At least 350 to 400 million tons are being produced. By the poor recycling process, millions of tons accumulate in terrestrial or marine environment causing imbalances to ecosystem and human beings. Recent microbial research has answered the question to plastic degradation mainly Polyethylene terephthalate which is a big problem for the present environment. It is hydrolysed by PETases, enzymes hydrolysing PET which are produced from different type of bacteria .Due to limited availability of PETases producing bacteria ,usage of genetically engineered organisms with PETases producing gene is helpful for resolving the PET degradation into the environment. PET is polar, linear polymer of repeating units of aromatic terephthalic acid and ethylene glycol. PET production has drastically increased to 30 million from 2017.

The degradation of PET appears to be upto limited bacterial phyla by different enzymes PET hydrolase, tannases, serine hydrolase. The disulphide bonds of cysteine residues bind to PET causing degradation. The bacteria Ideonella Sakaiensis 201-F6 produce PETases .Due to limited availability of this microorganism ,genetically engineered organisms with PETases , cutinases and lipases producing genes and finding the best enzymes degrading plastic from the Insilco genome mining studies Poly ethylene terephthalate degradation can be resolved and the plastic changes to low molecular weight polymers and meet the future demand of reducing plastic content in soil and environment there by global plastic content can be reduced.

Key words : Bioremediation, PETase, Ideonella Sakaiensis,

Abstract Code: CEU/05/O

BOX-BEHNKEN DESIGN ASSISTED FABRICATION AND CHARACTERIZATION

OF ACECLOFENAC LOADED MICROSPHERES USING NATURAL AND SEMI-

SYNTHETIC POLYMERS

NAZIA KHANAM* ,1 , MD AAMER QUAZI 2

1) Research Scholar, Faculty of Science and Technology, Dr. Babasaheb

Ambedkar Marathwada University, Aurangabad, Maharashtra.

2) Research Guide, K.T. Patil College of Pharmacy, Osmanabad, Maharashtra,

India.

ABSTRACT

The optimized microspheres were fabricated as a controlled release system for Aceclofenac (ACE) incorporating polymeric cross-linking with sodium alginate as natural and ethyl cellulose as semi- synthetic by ion-gelation technique. The method was optimized by Box Behnken design (BBD) incorporating concentration of pure drug, natural and semi-synthetic polymer along with the obtained responses that were mean particle size (Y1) and entrapment efficiency of drug (Y2). Microspheres were characterized for percentage yield, micromeritic evaluation, particle size, entrapment efficiency of drug, in-vitro study, FTIR, SEM, NMR and HPLC quantification of optimized formulation. It was observed that application of response surface method software for BBD yielded stable and spherical microspheres with mean particle size 67.89µm and entrapment efficiency of drug 79.03% for the most optimized formulation F9. The in-vitro release study revealed that the fabricated microspheres of ACE exhibited controlled release of drug for up to 12 hours by incorporating optimum polymeric combination and followed matrix diffusion mechanism. It can be concluded that bridging of ACE with highly innovative combination of natural and semi-synthetic polymers yielded stable, cost-effective microspheres with improved bioavailability and enhanced micromeritic properties with controlled release effect.

Key Words: Box-Behnken Design, Controlled release system, Aceclofenac, Nuclear magnetic resonance.

Abstract Code: CEU/06/O

DEVELOPMENT AND EVALUATION OF SOLID LIPID NONOPARTICLES LOADED HYDROGELS FOR DERMATOLOGICAL APPLICATIONS

AUTHOR NAME: SALAPAKA VENKATA PHANI RAHUL

RESEARCH SCHOLAR: CAREER POINT UNIVERSITY

DEPARTMENT: PHARMACEUTICS

PRESENTATION: ORAL PRESNTATION

ABSTRACT

Targeted drug delivery intends selective and effective transportation and accumulation of pharmacologically active drug in selected target organ thus increasing the effectiveness of the drug. To achieve this transportation and localization different carrier systems are used. Solid lipid nanoparticles (SLNs) are colloidal carrier systems developed in the beginning of 1990s as alternative to existing pool of carrier systems such as emulsions, liposomes and polymeric nanoparticles for the delivery of poorly water soluble drugs.

SLNs combine their advantages such as controlled release, biodegradability, and protection of active compounds. SLNs have been used in topical delivery as they can allow penetration of drug into the skin, offer sustained release of drug to avoid systemic absorption. The system also reduces irritation to the skin as they are made up of biocompatible excipients most of them have been in an approved status or are excipients used in commercially available cosmetic or pharmaceutical preparations.

Thus, topical application of SLNs based gel with increased penetration and retention through skin because of lipid nanoparticles will be much favorable for the treatment of infections and symptomatic relief.

Solid lipid nanoparticles are at the forefront of the rapidly developing field of nanotechnology with several potential applications in drug delivery, clinical medicine and research, as well as in other varied sciences. Due to their unique size-dependent properties, lipid nanoparticles offer the possibility to develop new therapeutics. The ability to incorporate drugs into nanocarriers offers a new prototype in drug delivery that could be used for secondary and tertiary levels of drug targeting. Hence, solid lipid nanoparticles hold great promise for reaching the goal of controlled and site specific drug delivery and hence have

attracted wide attention of researchers. This review presents a broad treatment of solid lipid nanoparticles discussing their advantages, limitations and their possible remedies. The different types of nanocarriers which were based on solid lipid like solid lipid nanoparticles, nanostructured lipid carriers, lipid drug conjugates are discussed with their structural differences.

Abstract Code: CEU/07/O

Dear D.R.Aruna Kumari,

Abstract title: **Formulation and Evaluation of Lamotrigine intra nasal in-situ gel using central composite design**

Abstract Code: CEU/102/P

Abstract Code: CEU/08/O

FORMULATION AND EVALUATION OF QUERCETIN LOADED IRON OXIDE NANOPARTICLES

Ch.Alekya, *K.Vijaya Lakshmi, K.Vijayasri, M.Sudhakar

Department of Pharmaceutics,

Malla Reddy College of Pharmacy (Affiliated to Osmania University),

Maisammaguda,Secunderabad-500 100,Telangana, India.

ABSTRACT:

Quercetin is a flavonoid, abundantly present in plants and has gained considerable interest as an antioxidant and chemo-preventive agent. The main aim of this study is to develop quercetin loaded iron-oxide nanoparticles with enhanced dissolution rate. The nanoparticles were evaluated by various parameters like Particle size, Zeta potential, entrapment efficiency, invitro drug release and DSC.Cyclodextrin and Polyethylene glycol reduces the toxicity of Ferrous oxide and also posess an impact on the poorly soluble bioflavonoid like quercetin. Characteristics peaks of the drug are not affected by physical mixtures of drug and the

polymers.As polyethylene glycol concentration increases, particle size also increases to some extent. Ferrous oxide nanoparticles also plays an important role in reducing the particle size which is evident from particle size batch F-3, at 1273nm.Out of all formulations, formulation F-3 has highest entrapment efficiency (74.40%) and invitro dissolution studies (90.71%) when compared to other formulations.The drug release rate of Quercetin nanoparticles is more when compared with the pure Quercetin.

Abstract Code: CEU/09/O

SOLID DISPERSIONS AS A TECHNICAL TOOL TO BOOST THE SOLUBILITY AND DISSOLUTION RATE OF POORLY SOLUBLE DRUG - SORAFENIB

T. Naga Aparna*, Dr. A. Sambasiva Rao, Varun Dasari

Department of Pharmaceutics, Sri Indu Institute of Pharmacy, Sheriguda (V),

Ibrahimpatnam (M), R.R District, Hyderabad Telangana

Abstract

The present work aimed to enhance the solubility and dissolution of the poorly water-soluble drug, Sorafenib (SFN), by solid dispersion (SD) techniques. Solid dispersions of Sorafenib were prepared by three different techniques, namely surface solid dispersions (SSD1-SSD15), melt granulation (MG1-MG15), liquisolid compacts (LSC1-LSC 9). All the formulations were evaluated for pre-formulation studies, solubility studies, percentage practical yield, % drug content, and *in-vitro* drug release. The best formulation based on drug release was further characterized for FTIR, XRD, SEM and stability studies. The formulations prepared by surface solid dispersions (SSD1-SSD15), melt granulation (MG1-MG15), liquisolid compacts (LSC1-LSC9) exhibited enhanced drug release compared to pure drug. Among all the formulations, Sorafenib prepared by Melt Granulation technique (MG 3) showed highest drug release. The order of preference for solid dispersions prepared by different techniques was MG 3 > LSC 1 > SSD 3. The formulation MG 3 was further characterized for FTIR, where no significant changes were observed, suggesting no interactions between drug and excipients. X-ray diffraction studies revealed the conversion of sorafenib from the crystalline state to the amorphous, which was further supported by scanning electron microscopy. Stability studies proved the formulation was stable for 3 months. These findings suggest that the preparation of Sorafenib solid dispersions

using Melt Granulation technique could be a promising strategy for improvement of solubility and dissolution.

Abstract Code: CEU/10/O

DEVELOPMENT AND EVALUATION OF NANOSPONGES BASED BUCCAL TABLETS FOR DELIVERY OF CURCUMIN USING BOX-BEHNKEN DESIGN

Praveen Gujjula*, S Angala Parameswari#

*** Research Scholar, JNTU Anantapur - 515002.**

 # Research Guide, JNTU Anantapur - 515002.

ABSTRACT

The current research is aimed at developing Nanosponges Based Buccal Tablets for Delivery of Curcumin for enhanced solubility, oral bioavailability, controlled release followed by *in vivo* and *in vitro* evaluation. Based on the preliminary trials a 3-factor, 3-level Box-Behnken design was employed. Five types of nanosponges from β-cyclodextrin (NS1-NS5) were purposely designed. The prepared nanosponges were characterized and formulated into tablets and evaluated.

Based on the early trials, a three-factor, three-level Box-Behnken design was used to investigate the influence of each independent variable on the dependent variables. Five different forms of cyclodextrin nanosponges (NS1-NS5) were created. The freeze-drying process was used to load curcumin into nanosponges. The nanosponges were analysed, made into tablets, and tested. The particle diameter, encapsulation efficiency and drug release percentage were evaluated. Curcumin interaction with nanosponges was validated by FTIR, DSC, and XRPD investigations. The nanosponges subsequently formulated into tablets and tested for weight variation, hardness, friability, and disintegration and the results were positive. For a period of 24 hours, *in-vitro* drug release from tablet revealed regulated release behaviour. The medicine may be maintained and released gradually over time by the nanosponge structure and within 6 months, stability testing revealed no major changes. *In vivo* pharmacokinetic studies of Curcumin nanosponges buccal tablets were carried out in male wister rats. At any time, point, the drug plasma concentrations in animals administrated with optimised nanosponges buccal tablets was higher than that of pure drug. C_{max} of the nanosponges buccal tablets was significant ($p<0.05$) as compared to the pure

drug suspension formulation. T_{max} , $AUC_{0-\infty}$, AUC_{0-t} of the nanosponges buccal tablets formulation was significantly higher ($p<0.05$) as compared to pure drug suspension formulation. Higher amount of drug concentration in blood indicated better systemic absorption of Curcumin from nanosponges buccal tablets formulation as compared to the pure drug suspension formulation**.** It is concluded that cyclodextrin based nanosponges showed superior complexing ability with increased solubility of poorly soluble curcumin tablets made for controlled drug delivery, which can reduce dosing frequency.