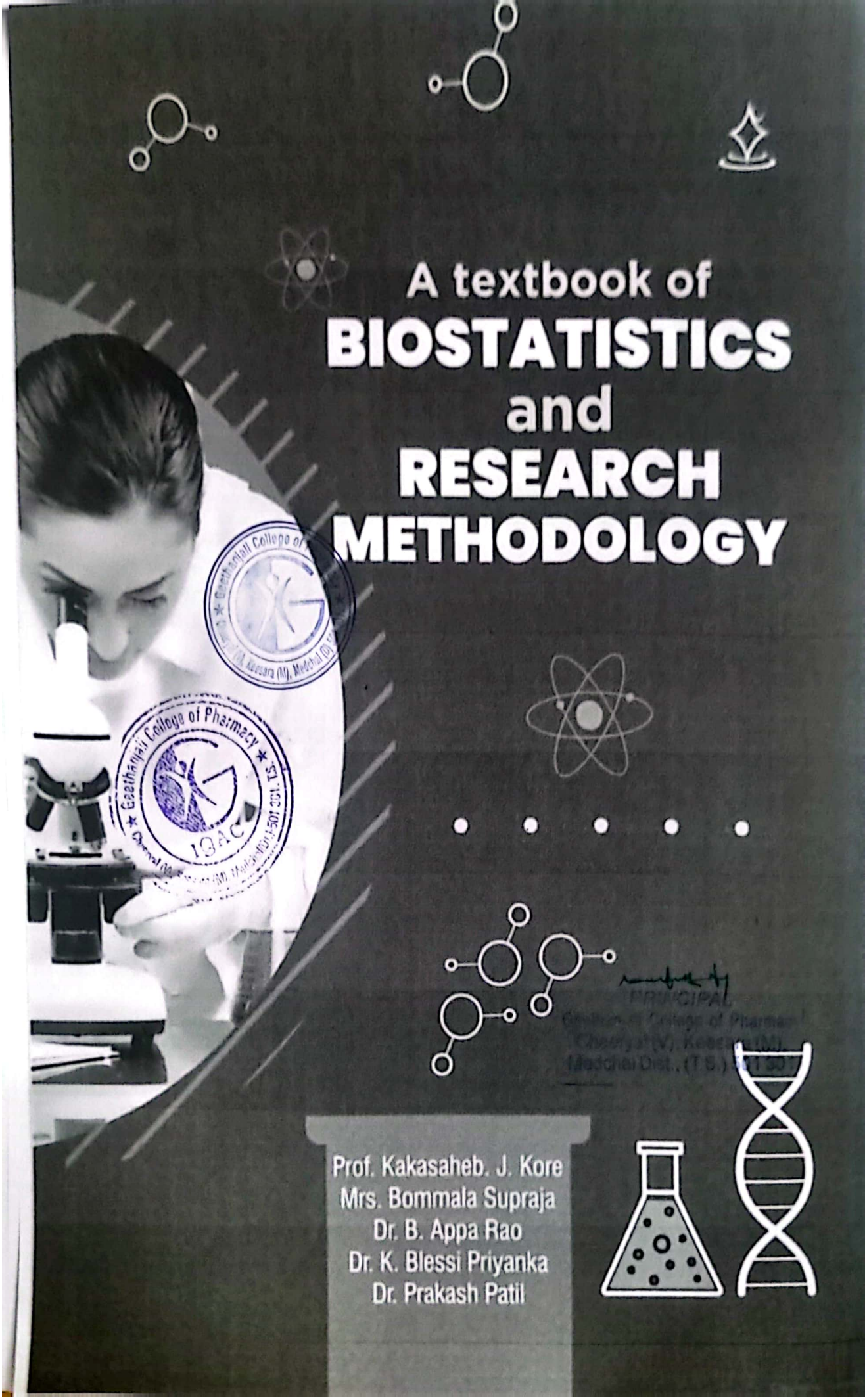

A textbook of BIOSTATISTICS and RESEARCH METHODOLOGY

Prof. Kakasaheb. J. Kore
Mrs. Bommala Supraja
Dr. B. Appa Rao
Dr. K. Blessi Priyanka
Dr. Prakash Patil

Gaethangiri College of Pharmacy
PRINCIPAL

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[redacted] papers in National and International Conference at Bhutan, Nepal and in India, also got Best paper presentation award. He has published and presented more than 40 research papers in National, International Journals & Conferences. He has attended more than 20 Conferences/ Seminars/ Workshops. He has guided a number of PG students; He has four books on his credit, also delivered a number of guest lectures in different colleges. He has completed 02 research projects under SPPU, Pune. He has worked as a member of the staff selection committee. He is a life member of Association of Pharmaceutical Teachers of India (APTI). He is actively engaged in Teaching, Research, Administration and service to his profession. Mrs. Bommala Supraja is working as an Assistant Professor for the branch of Pharmaceutics at Geethanjali College of Pharmacy. She completed her master's degree at Vigan Institute of Pharmaceutical Sciences, JNTU Kakinada in 2013. She started her teaching profession in 2014, with a passion for research, she guided M. Pharm and B. Pharm projects and worked as a Senior Research Fellow, for the SERB project. She attended more than 22 national and international conferences and was Awarded Second prize at the International Conference PHARMA TRANSPIRE-2016. She, with a multifaceted view of pharmacy, was trained in 3D printing technology at IIT, Hyderabad. She published papers in national and international journals and is interested in researching and publishing in the fields of Nanotechnology, Herbal Drug molecules, and alcohol addiction and its withdrawal with Maze models.

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DAY1

Breakout Room 5

OCPP8

Polycystic Ovarian Syndrome: A Kap Study among Pharmacy and Engineering Students in A Private College, Telangana State, India

Druthika Konkati[1*], Nikitha Odhala[1], Ujwala Koukuntla[1], Abdul Nazer Ali[2]

[1]*Research Scholar, Department of Pharmacy Practice, Geethanjali College of Pharmacy, GCP, Cheeryal, Telangana, India.*
[2]*Department of Pharmacy Practice, Geethanjali College of [2]Pharmacy, GCP, Cheeryal, Telangana, India*

***Presenting Author:** Druthika Konkati
Corresponding Author: Abdul Nazer Ali: abdul.nazerali16@gmail.com

Background: Polycystic ovarian syndrome (PCOS) is a chronic health condition, which has no cure and is largely neglected by females. **Objectives:** The main objectives were to assess the Knowledge, attitude and practice (KAP) regarding PCOS among female students from a private pharmacy and engineering college in Telangana State, India. **Methodology:** A prospective, cross-sectional study among 418 female undergraduate students aged between 18 and 25 years was conducted using a pre validated PCOS questionnaire and its Cronbach's reliability coefficient was α= .978. The study was conducted between September 2022 and February 2023 for a period of 6 months. All the scores were categorized based on original blooms cut-off scale. The proposal, informed consent form and study tool were submitted to the GCP Ethics committee and approval was obtained before initiation of the study. The data collected were analysed using SPSS version 24. **Results:** Among the 500 survey forms distributed, 418 (response rate = 84%) complete survey forms were retrieved. The Total Knowledge Score (TKS) among 76% was found to be poor with a median (IQR) score of 8 (7), whereas about 59% of respondents Total Attitude Score (TAS) were found to be neutral with a median (IQR) score of 42 (8), and about 46% of respondents Total Practice Scores (TPS) were poor with a median (IQR) score of 6 (4), and the study also observed that the total KAP score to be moderate (51%) with the median (IQR) score of 55 (11). The study reported a significant association ($p<0.01$) between TKAPS, TKS, TAS, and TPS.**Conclusion:** This study shows that the respondents' KAP scores related to PCOS are moderate. This study makes it evident that health education and awareness regarding PCOS needs to be improved among pharmacy and engineering students.

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DAY1 Breakout Room 5

OCPP11

Development & Validation of Polycystic Ovarian Syndrome Survey Questionnaire

Nikitha Odhala[1*], Druthika Konkati[1], Ujwala Koukuntla[1], Abdul Nazer Ali[2]

1. Research scholar, Department of Pharmacy Practice, Geethanjali College of Pharmacy, Cheeryal (V), Keesara (M), Medchal (D), Telangana, India.
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***Presenting Author:** Nikitha Odhala
Corresponding Author: *Dr.* Abdul Nazer Ali (abdul.nazerali16@gmail.com),

Background: Polycystic ovarian syndrome (PCOS) is a common endocrine disorder in women and a chronic health condition often overlooked, highlighting a concerning a global healthcare gap among females. **Objectives:** To develop and validate the PCOS survey questionnaire for knowledge, attitude and practice (KAP) studies. **Methodology:** The PCOS questionnaire was designed in English and its contents were adapted from various literatures and modified to suit our study objectives. The initial draft questionnaire consisted of four sections (45 items excluding demographics), first being the demographic information's, second with 21 knowledge-based questions, third was the 12 attitude-based questions and fourth with 12 practice-based questions respectively. The PCOS questionnaire was validated for its contents and construct by five pharmacy practice faculty and face validation and reliability test using Cronbach's reliability coefficient (α) was also done. A pilot study for reliability of study tool was conducted among 30 potential respondents. The data were analyzed using SPSS version 23. The pilot study was carried out prior to beginning the original study and the participants in pilot study were excluded in the final survey. **Results:** The final draft of questionnaire was subjected to known group's validity, test-retest and intra- class correlation coefficient (ICC) to compare total knowledge scores, total attitude scores, total practice scores and the total KAP scores. Cronbach's alpha coefficient is considered to be a measure of scale reliability which was found to be 0.978, with excellent reliability for the final 41 items after removing four items with negative correlations. **Conclusion:** This pilot study signifies excellent reliability and internal consistency of the PCOS questionnaire. This questionnaire signifies a pivotal step towards enabling early detection, ensuring timely intervention, improved quality of life for those affected, empowering awareness and fostering proactive healthcare.

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DAY1 Breakout Room 5

OCPP12

Awareness, Knowledge and Medication Adherence Among Hypertensive Patients in a Territory Care Hospital

Asma Fathima[1*], Baba Mahammed[1], Saba Anjum[1], Sameera Sultana[1], Abdul Nazer Ali[2]

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***Presenting Author:** Asma Fathima
Corresponding Author: Abdul Nazer Ali (Anazerali.Gcp@Gcet.Edu.In)

Background: hypertension is a most prevalent disease that requires lifestyle modification and lifelong medication. Despite the importance of managing hypertension, many patients lack sufficient knowledge about their condition, leading to low medication adherence and poor outcomes. **Objective:** the main objectives of this study were to assess the awareness, knowledge, and medication adherence among hypertensive patients in a private territory care hospital, telangana state, india. **Methodology:** a prospective, observational, cross-sectional survey was conducted among 273 hypertensive patients using a pre-validated structured questionnaire. The questionnaires measure the level of awareness, knowledge, and adherence to medication. Ethical clearance and informed consent forms were received before initiating the study. The data were analysed for descriptive and inferential statistics using spss version 24. **Results:** among the 273 participants in the study as per the inclusion criteria, 58% had adequate awareness and knowledge about hypertension. The mean (sd) drug adherence score was found to be 1.15 (0.71), indicating moderate adherence to medication. The study found a weak positive correlation between knowledge and medication adherence, and a poor knowledge (35%) of the disease being the most common reason for non-adherence. **Conclusion:** the study concluded that there was a moderate level of awareness, knowledge, and medication adherence among the study participants with a significant association between them. The study also identified the factors that influence the level of awareness, knowledge, and medication adherence of the patients.

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To,
Dear Santhosh Kumar Banoth

This certificate confirms that **Santhosh Kumar Banoth** is the author of book chapter titled **"Nanotechnology in Herbal Medicine: New Perspectives and Challenges"** of published book entitled **"Techniques and Innovative Research in Pharmaceutical Science (Volume - 4)"** having ISBN **978-93-6233-732-0**.

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Possible insilico exploration of alpinia mutica and tradescantia spatheca for diabetes mellitus

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Abstract

Molecular docking is computed aided tool to predict the interaction between protein and ligand. Several herbs were used in diabetic mellitus. In the current research article two medicinal plants naming *Alpinia mutica* and Tradescantia *spatheca* are screened against 4 protein to determine its *In silico* anti-diabetic potential. Fourty two constituents from *Alpinia mutica* and nineteen constituents from *Tradescantia spatheca* screened against targets namely Glutamine: Fructose-6-Phosphate Amindotransferase (GFAT,PDB ID-2ZJ3), Tetrameric 11b-HSD(PDB ID-1XU7), Aleglitaar (PDB ID-3G9E), Human SIRT6 (PDB ID-3K35) and protein tyrosine phosphatase - 1B(PDB ID-4Y14) were assessed. Molecular docking studies were performed using tool Autodock vina, biovia discovery studio and open bable, Additionally the Swiss ADME were utilized for its pharmacokinetic prediction. The docking studies with the ligands shows great inhibitory effect; In *Alpinia mutica*; 1,7-diphenyl-3-hydroxy-6-heptene5-one(-9.0kcal/mol) has the highest binding energy with protein 3K35;bisabolol(-8.1kcal/mol) with 2ZJ3; Flavokwain (-8kcal/mol) with 1XU7;1,7-diphenyl-3-hydroxy-6-heptene5-one(-6.9kcal/mol) with 4Y14 and Flavokwain (-7.8kcal/mol) with 3G9E.In *Tradescantia spatheca*, rutin (-10.1 kcal/mol),(-9.4 kcal/mol)and (-8.7 kcal/mol) respectively shows highest effect with 1XU7,2ZJ3 and 3G9E;bracteonalide A(-9.1kcal/mol) shows highest binding energy with 4Y14.

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INTRODUCTION

Diabetes is a growing metabolic disorder caused by disrupted metabolism of sugar, proteins well as fat. [1-2] It causes many problems because of decreased insulin secretion or working action of insulin and affect people of all age group.[3] Diabetes in children is easily identified by symptoms like excessive urine, polydipsia, blurring of vision, loss of weight etc.[4] According to

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Shankaraiah Pulipaka; Ashish Suttee ✉; M. Ravi Kumar; Mary Chatterjee

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Review on drug discovery and drug development

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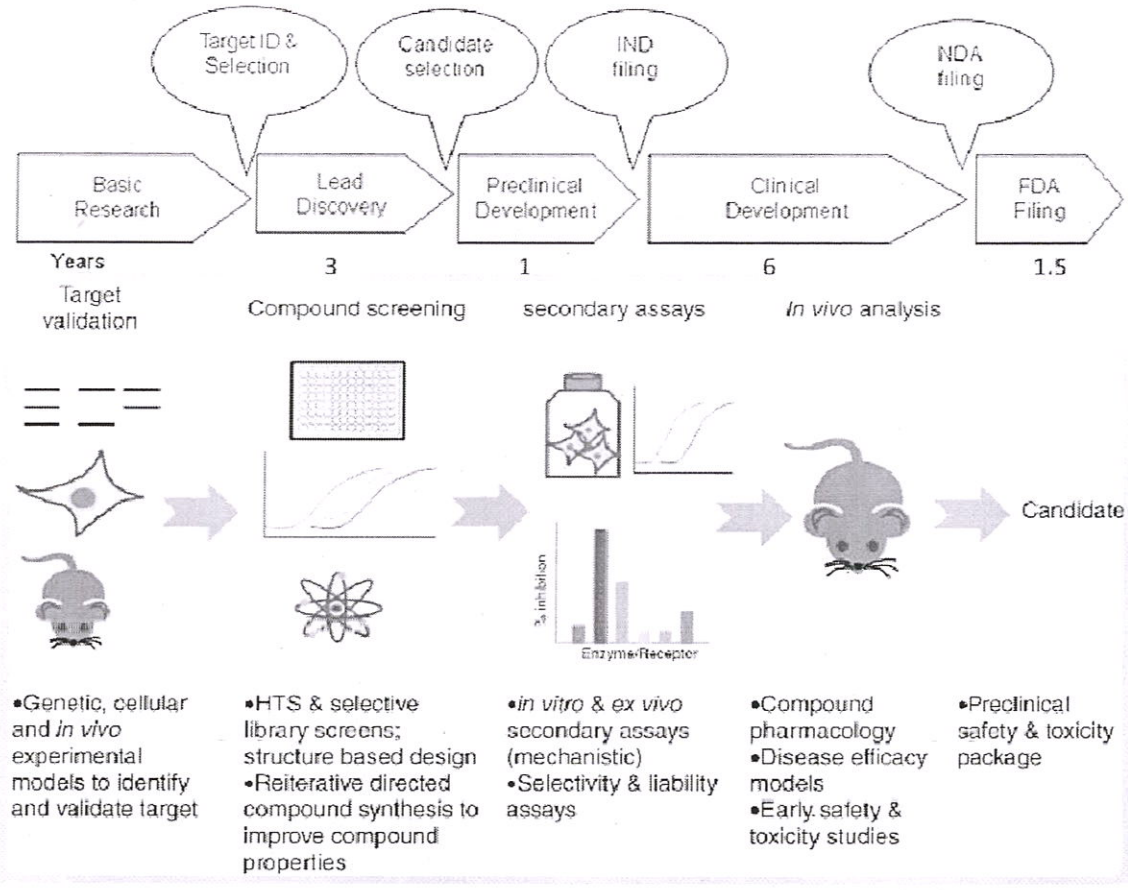
Abstract

Developing a new drug may originate from the business sector, clinical and academic research, or from any combination of these sources. Before choosing a target for an expensive drug discovery effort, a body of supporting evidence may need to be gathered over a number of years. Following the selection of a target, the pharmaceutical industry and, more recently, certain academic institutions have streamlined a number of preliminary steps to identify compounds that have the necessary properties to manufacture approved medications. The main preclinical phases of the drug discovery process will be examined in this study, starting with the first target identification and validation and continuing through the development of assays, high throughput screening, hit identification, lead optimization, and, at the end, the choice of a candidate molecule for clinical development.

Introduction

A sickness or clinical condition for which there are no appropriate pharmaceuticals on the market leads to the start of a drug discovery program, and this unmet clinical need serves as the project's primary source of motivation. The preliminary study, which is frequently conducted in academic settings, produces information to support the hypothesis that a protein's or pathway's activation or inhibition will have a therapeutic effect in a disease state. The result of this action is the identification of a target that, in order to support a drug development endeavor, may need additional validation before moving forward into the lead discovery phase (Figure 1).



A thorough search is conducted during lead discovery to identify a biological treatment or small molecule that resembles a drug and is commonly referred to as a development candidate. If successful, this candidate will move on to preclinical and, if approved, clinical development (Figure 2), where it will eventually be marketed as a medicine.

A summary of assays used in drug discovery screening.

Identification of the target:

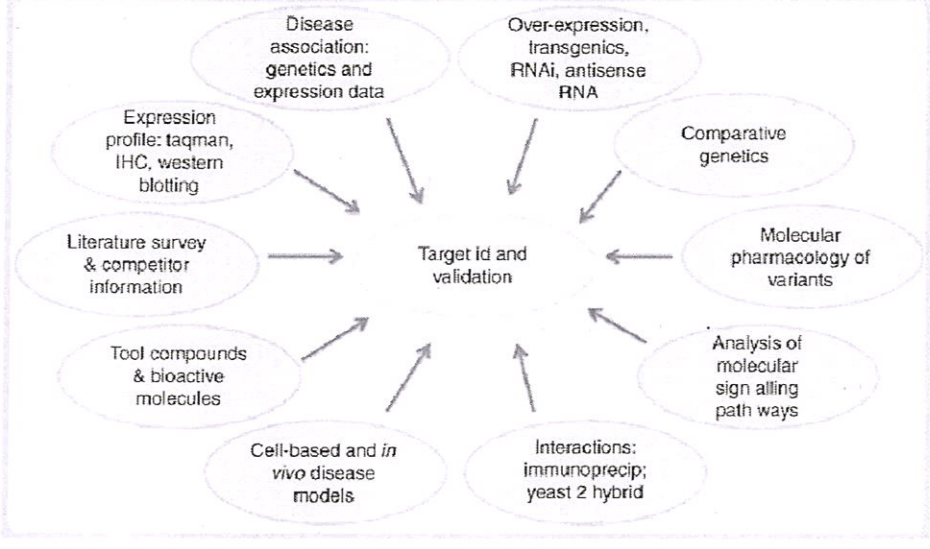
There are two primary reasons why drugs fail in clinical settings: either they are unsafe or they don't work as intended. Thus, target selection and validation rank among the most crucial phases in the development of a novel medication. A good target should be safe, effective, able to meet commercial and therapeutic needs, and, most importantly, "druggable." A putative drug molecule can access a "druggable" target, which can be a small molecule or a larger biological target, and upon binding causes a biological reaction that may be assessed in vivo and in vitro. It is now

established that while antibodies are effective at obstructing protein/protein interactions, other target classes—such as G-protein-coupled receptors (GPCRs)—are better suited for small molecule drug discovery.

Data on gene expression, proteomics, transgenic phenotyping, publications, patent information, and compound profiling are among the many sources of the available data. Examining mRNA/protein levels to see if they are expressed in disease and whether they are connected with disease progression or exacerbation is another identification strategy. For instance, does a genetic polymorphism function, or is there a connection between it and the likelihood of developing a disease or its progression? For instance, Alzheimer's disease (AD) in families. Human phenotypes can also result from mutations that negate or over activate a receptor. One such example is the voltage-gated sodium channel NaV1.7, where both mutations cause a phenotype of pain, either insensitivity or oversensitivity. Phenotypic screening is an alternate method for identifying disease-relevant targets.

Target validation:

The target must next be thoroughly investigated after being located. Techniques for validation include modulating a desired target in sick patients and using complete animal models as in vitro tools. Although each strategy is legitimate on its own, a multi-validation approach significantly increases confidence in the observed conclusion (Figure 3).



The procedure of target ID and validation has multiple functions. Immunohistochemistry, or IHC

Antisense technology is a potentially potent method that makes use of chemically modified oligonucleotides that resemble RNA and are aimed to complement a specific area of a target mRNA molecule (Henning and Beste, 2002).

Researcher Honore et al. (2002) provided a perfect example of the potential of antisense technology, demonstrating how antisense probes to the rat P2X3 receptor might be produced. However, the chemistry used to make oligonucleotides has resulted in the creation of compounds with high toxicity and limited bioavailability, which makes using them in vivo difficult.

On the other hand, because transgenic animals utilize entire animals and make it possible to observe phenotypic endpoints that clarify the functional impact of gene manipulation, they are a desirable validation method. Animals that were created in the early days of gene targeting were created without the ability to function with a certain gene, both at birth and throughout their lifetimes. While normal nociceptive processing is retained, mice lacking P2X7 receptors exhibit no inflammatory or neuropathic hypersensitivity to mechanical or heat stimuli.

Additionally, these transgenic mice were employed to verify the mechanism of action for this ablation in vivo, despite the transgenic animals showing no reduction in IL-1beta mRNA expression, they were unable to release the mature pro-inflammatory cytokine IL-1beta from cells. When a protein has both structural and enzymatic functions, for instance, these animals may have a different phenotype than knockouts (Abell et al., 2005).

The desire to create inducible and/or tissue-restricted knockouts has increased recently. The primary motivation behind the technical difficulty of these techniques is the necessity to overcome the embryonic lethality of the homozygous null animals. Avoiding developmental abnormalities and compensating mechanisms owing to a persistent lack of a gene-encoded function are two more causes.

In order to create double-stranded fragments of 21–25 base pairs with a few unpaired overhang bases on each end, the ribonuclease protein Dicer is activated. siRNAs are these brief double-stranded snippets. After being divided into single strands, these siRNAs are incorporated into an active RNA-induced silencing complex (RISC). Reviewed in Castanotto and Rossi (2009, siRNAs are integrated into the RISC, whereupon they base-pair to their target mRNA and cause cleavage, hence blocking the mRNA's usage as a translation template.

Chemical genomics is a more modern field that involves the systemic deployment of tool

molecules for target validation and identification. One definition of chemical genomics is the study of how the genome reacts to chemical substances. The objective is to quickly identify new medications and drug targets by utilizing a variety of early-phase drug discovery procedures, such as compound design, chemical synthesis, biological testing, target validation, and identification.

The hit discovery process:

Compound screening assays are designed during the hit identification and lead discovery phases of the drug discovery process, which come after target validation. Researchers may define a "hit" molecule differently, but for the sake of this review, a "hit" is defined as a compound that exhibits the expected activity on a compound screen and whose activity is validated through retesting.

In order to find molecules that interact with the drug target, high-throughput and other compound screens are developed and run; chemistry programs are run to enhance the molecule's potency, selectivity, and physiochemical properties; and data are continuously developed to bolster the hypothesis that intervention at the drug target will be effective in the disease state. In order to find candidate compounds for clinical development, this category of activities is the focus of significant attention both within academia and the pharmaceutical industry.

Lately, there has been a growing interest from the academic community in the tasks often carried out during the lead discovery stage of the pharmaceutical business. Assays for drug development are now formatted by academic scientists and sent to academic drug discovery centers for compound screening.

The creation of biological tests to be employed in the identification of molecules with activity at the therapeutic target is the first step in a typical program critical path during the lead discovery phase. These assays are used to screen compound libraries and find compounds of interest once they are produced. When a compound screen yields an output that has been shown to have particular activity at the target protein, it is commonly referred to as a hit molecule. A lead optimization chemistry program based on screening hits aims to boost the chemical series' effectiveness at the main drug target protein. Phase compounds are also evaluated in animal models of disease and in cell-based assays predictive of the disease state during lead discovery to assess the compound's likely safety profile as well as its efficacy (Figure 2). More information on the needs and use of compound screening assays in hit and lead discovery can be found in the paragraphs that follow.

Defining a hit series

Small molecular weight molecules that adhere to chemical parameters, such as the Lipinski Rule of Five (Lipinski et al., 2001), have been assembled into compound libraries. These molecules typically have molecular weights of less than 400 and clogP (a measure of lipophilicity that influences absorption into the body) of less than 4. These characteristics have led to the designation of molecules as "drug-like," acknowledging the fact that most clinically licensed medications have molecular weights of fewer than 350 and cLogP values of less than 3.

Identifying which compounds are the best to work on is the first task for the drug development team after a number of hits have been obtained using virtual screening or HTS. A team will probably be left with a huge number of potential hits from a large library, which they will need to narrow down, validate, and cluster into series. This is why the triaging process is so important.

First, chemicals that the library curators know to be frequent hitters in HTS campaigns need to be re-moved from further consideration, even if this is less of an issue now that library quality has improved. Secondly, several computational chemistry methods have been created to cluster hits according to their structural similarity, guaranteeing that a wide range of chemical classes are included in the list of compounds that are advanced.

The subsequent stage of the preliminary refining procedure involves producing dose-response curves in the primary test for every hit, ideally using a new drug sample. It's crucial to exhibit typical competitive behavior in hits. The activity at high concentrations is likely the result of an interaction between the sample and another element of the assay system. Compounds that produce an all-or-nothing response are not acting reversibly and may not even be binding to the target protein. Because their effects can be "washed-out" more readily after drug withdrawal, reversible chemicals are preferred; this is an important factor to take into account while employing in patients.

The stage is set to investigate the surviving hits in a secondary assay, if one is available, for the target of choice, with dependable dose-response curves produced in the first test for the target. This test does not have to be a high throughput format; instead, it will examine how the compounds effect a functional response, as in the case of a tissue-or cell-based bioassay or a second messenger assay. If drugs are able to affect more complete systems instead of just the isolated and frequently

altered protein utilized in the primary assay, activity in this context will provide comfort.

Throughout this process, each cluster's characteristics will be taken into account, such as whether a discernible structure-activity relationship (SAR) is evolving across a number of compounds; this refers to the identification of a group of compounds that share a section or chemical motif, and the addition of different chemical groups to this core structure results in different potencies. We would also look at issues related to chemical synthesis. As a result, evaluation criteria would include simplicity of preparation, possible suitability for parallel synthesis, and capacity to produce variety from late-stage intermediates.

Phase of hit-to-lead

This phase of the project aims to improve each hit series in an effort to create more powerful and selective compounds with sufficient PK characteristics to test their effectiveness in any existing in vivo models. These days, the effort usually entails extensive SAR studies surrounding each core chemical structure, with measurements being done to determine each compound's level of activity and selectivity. This must be done methodically. Structure-based drug design approaches that involve molecular modeling and techniques like X-ray crystallography and NMR can be used to create the SAR more quickly and precisely when structural information about the target is known. Additionally, this kind of action frequently results in the identification of novel binding sites on the target proteins.

Many substances may be profiled in large pharmaceutical companies with in-house drug metabolism pharmacokinetics (DMPK) departments, however funding for these costly studies may only be available for a set number of these studies in university settings. A number of compounds with potencies in the nanomolar range and benign selectivity profiles were developed as the receptor antagonist program, previously mentioned, progressed through the hit-to-lead phase. The exception was some potency at the potassium voltage-gated ion channel hERG channel, which is important for cardiac function and whose inhibition can result in cardiac liability.

Phase of lead optimization

The goal of this last stage of medication development is to strengthen lead structural weaknesses while preserving beneficial aspects of lead compounds. Using the previous example again, the program's goal was to change the structure to reduce hERG liability and enhance compound

absorption. As a result, more frequent assessments of the hERG affinity and CACO2 penetration were carried out, and soon after, compounds that were considerably less hERG affinity and had a better apparent penetration than the original lead compounds were available. These compounds also retained their potency and selectivity at the primary target. The process of discovery is ongoing at this point. In the event that the drug undergoing additional preclinical or clinical characterization fails, the team must continue its synthetic exploration in order to generate viable backup compounds and, more strategically, to search for follow-up series.

Companies will differ in the stages at which they complete the various components of further characterization, and some of this process may be integrated into the lead optimization stage. Generally speaking, though, compounds must be investigated in genotoxicity models like the Ames test and in vivo general behavior models like the Irwin's test. With all of the molecule's information acquired thus far, a target candidate profile can be created. This profile, along with toxicological, chemical, and manufacture and control considerations, will serve as the foundation for a regulatory submission that will enable the start of human administration.

There are seldom any shortcuts, and substantial, intelligent participation from scientists with diverse training and specializations is needed. The primary factors influencing the effectiveness of this work phase are the caliber of the hit-to-lead beginning point and the knowledge of the available team. Because an extensive HTS is expensive, screens in academia are more likely to be focused or contain compounds that are produced via a structure-based method. Just 10% of industrial small molecule projects may go to candidate status, failing several times along the way. These can include: (i) not being able to set up a reliable assay; (ii) not having any developable hits from the HTS; (iii) compounds not behaving as desired in native tissue or secondary assays; (iv) compounds being toxic in vivo or in vitro; (v) compounds having unwanted side effects that are difficult to separate from the target's mode of action; (vi) incapacity to obtain a good PK or PD profile in accordance with the dosing regimen required in humans; for instance, if a once-daily tablet is required, the compound must have a half-life in vivo appropriate to accomplish this; and (vii) incapacity of compounds whose target is located within the central nervous system to cross the blood brain barrier. Once the target has been determined, the attrition rate for protein therapies is significantly lower since certain proteins, like antibodies, have less off-target selectivity and prior expertise with their PK.

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High-Performance Liquid Chromatography Analysis of Lobeglitazone: Method Development and Validation for Bulk and Tablet Formulations

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ABSTRACT

In this research, a straightforward, accurate, and precise reverse-phase high-performance liquid chromatography method was developed to determine the quantity of Lobeglitazone in both bulk and pharmaceutical dosage forms. The chromatographic separation was achieved on a Phenomenex Luna column with dimensions of 250 cm × 4.6 mm × 5 µm, and the mobile phase was a combination of potassium dihydrogen orthophosphate and acetonitrile in a 70:30 V/V ratio with a pH of 4.0, adjusted using orthophosphoric acid. The flow rate was set at 1.0 mL/min, and detection of the effluents occurred at 250 nm. The retention time for Lobeglitazone was determined to be 2.157 minutes. The drug exhibited linearity within the concentration range of 10–60 µg/mL. The analytical results were validated in accordance with the requirements outlined in the ICH guidelines.

Keywords: Lobeglitazone, method development, validation, RP-HPLC.

INTRODUCTION

Type 2 diabetes mellitus (T2DM) is a chronic, progressive metabolic disorder. It has long-term effects on the body, characterised by insulin resistance and β-cell dysfunction[1]. T2DM is a complex and multifactorial disease involving a number of underlying mechanisms. As a result, there are multiple approaches available to manage the condition[2]. There are several classes of oral anti-diabetic agents (OADs) available, but the thiazolidinedione (TZD) class stands out because it

primarily targets insulin resistance[2]. The TZDs improve insulin sensitization and enhance glucose and lipid metabolism by activating the proliferator-activated receptor γ (PPARγ)[3]. In type 2 diabetes, rosiglitazone and pioglitazone are the most commonly used drugs for better glycemic control by promoting insulin sensitivity. Due to cardiovascular and bladder cancer risks, their use has declined in recent years[4]. The newly developed thiazolidinedione "lobeglitazone" (Chong Kun Dang Pharmaceutical Corporation, Seoul, Korea) provides a safer and more effective alternative to existing TZDs[5]. It works similarly to pioglitazone on glycemic control but requires lower doses. Furthermore, clinical studies have indicated positive results in terms of safety, addressing some of the concerns associated with other TZDs. Since July 2013, it has been used in Korea as a treatment for T2D due to its pleiotropic effects in preclinical and clinical studies[6, 7]. As a pharmacophore, lobeglitazone consists of a 2,4-thiazolidinedione group bound to an ethoxy-benzyl N-methylamino group (see Figure 1). Its structural formula is C24H24N4O5S, and the chemical name is 5-[4-(2-{[6-(4-Methoxy phenoxy) pyrimidin-4-yl] methyl-amino}-ethoxy)-benzyl]-thiazolidine-2,4-dione hydrosulphuric acid[8].

Lobeglitazone tablets are available on the market under the brand name Lobg (Glenmark Pharmaceuticals Ltd.). Jong-Hwa Lee et al. developed a validated assay using liquid chromatography and tandem mass spectrometry to perform pharmacokinetic studies of Lobeglitazone in rats[9]. Gulhane et al., developed a bioanalytical method for the estimation of Lobeglitazone in human plasma[10]. The literature survey indicates that other than a few bioanalytical methods, no method has been reported so far for estimating Lobeglitazone in pharmaceutical dosage forms.

Analytical methods keep evolving as requirements change so that they are simple, reliable, cost-effective, reproducible, and, above all, accurate and precise. Our study aimed to develop a rapid, robust, selective, sensitive, and precise isocratic RP-HPLC method for the determination of Lobeglitazone (LOBGL) in tablet dosage forms. The assay method was validated using ICH guidelines[11]. The linearity, accuracy, precision, specificity, limit of detection (LOD), and limit of quantification (LOQ) were used for the determination of the drug content of the LOBGL in pharmaceutical products.

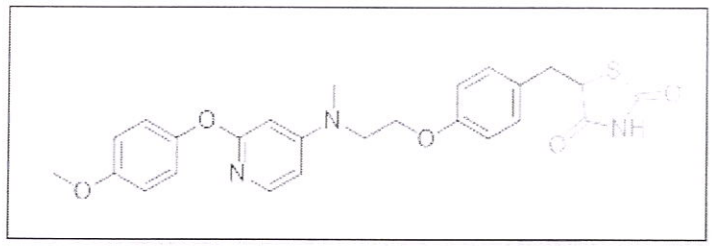

Figure 1: Chemical structure of Lobeglitazone

MATERIALS AND METHODS

Instruments

The analysis was performed using an HPLC system, specifically the Shimadzu HPLC model (VP series) containing the LC-10AT (VP series) pump, variable wavelength programmable UV/VIS detector SPD-10AVP, and Rheodyne injector (7725i) with a 20 µl fixed loop. The chromatographic data acquisition was managed using Empower software version 2. For weighing and sample preparation, an analytical balance from Mettler Toledo was employed. The chromatographic separation was carried out using a Phenomenex Luna C18 column with dimensions of 250 cm × 4.6 mm × 5 µm.

Reagents and chemicals

All reagents and solvents used in the study were of high quality and met analytical and HPLC-grade standards. Acetonitrile, potassium dihydrogen orthophosphate, and orthophosphoric acid were procured from Sd Fine-chem Ltd., Mumbai, India. To ensure the purity of the water used, high-quality deionized water was obtained through a process of double distillation and purification using the milli-Q water purification system. For filtration purposes, 0.45 µm nylon filters were employed, and these filters were purchased from Advanced Micro Device Pvt. Ltd., Chandigarh. The use of such high-grade reagents, solvents, and filters helps to ensure the accuracy and reliability of the HPLC analysis.

Chromatographic conditions

The experiments were conducted using an isocratic elution method, where the mobile phase composition remained constant throughout the analysis. The binary mobile phase consisted of a mixture of potassium dihydrogen phosphate buffer (0.02 M) and acetonitrile in a volumetric

ratio of 70:30. 0.1% orthophosphoric acid was used to achieve a pH of 4.0 for the mobile phase, and the resulting solution was filtered through a membrane filter to remove any particulate matter. Before running the samples, the mobile phase was degassed to remove dissolved gases that could interfere with the analysis. The flow rate of the mobile phase during the HPLC analysis was set at 1.0 mL/min. The column temperature was maintained at ambient conditions, specifically 27 °C, during the chromatographic separation. For each run, a 20 µL volume of the sample was injected into the HPLC system, and the effluents from the column were detected using a UV detector at a wavelength of 250 nm. This specific wavelength was chosen to detect the Lobeglitazone based on its characteristic UV absorption. By employing these experimental conditions, the HPLC system could effectively separate and quantify Lobeglitazone in the sample, providing reliable and accurate results for analysis.

RESULTS AND DISCUSSION

During the method development process for the determination of Lobeglitazone using HPLC, several chromatographic parameters were optimised to achieve specific criteria. The goal was to establish an HPLC method with a short analysis time (<5 minutes) and acceptable resolution (Rs > 2). During the different trials, various mobile phases were employed, such as water:methanol (65:35 V/V), buffer:methanol (30:70 V/V), and phosphate buffer:acetonitrile (70:30 V/V), in different ratios.

Among the tested mobile phase compositions, the combination of phosphate buffer pH 4.0 and acetonitrile provided the most favourable results. It resulted in symmetrical peak shapes and good resolution for Lobeglitazone. The optimum wavelength for detection was determined to be 250 nm, which is the wavelength at which Lobeglitazone exhibits a significant UV absorption signal (see figure 2).

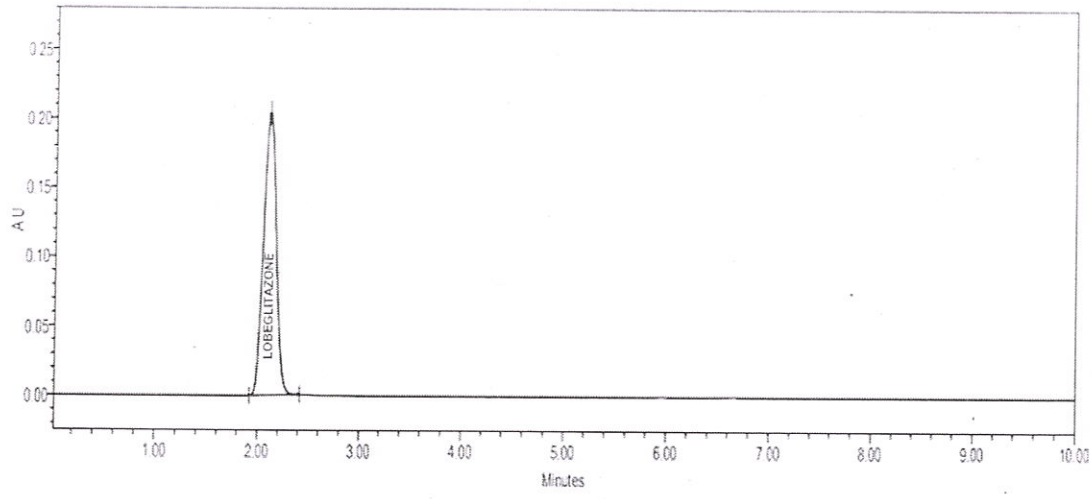

Figure 2: Chromatogram for Standard

As a result of the method optimisation, the retention time for Lobeglitazone was found to be 2.15 minutes, which ensures that the compound is well separated and detected within a reasonable time frame. Overall, by carefully selecting the mobile phase composition, using the appropriate wavelength, and optimising other parameters, the developed HPLC method for Lobeglitazone analysis meets the desired criteria of short analysis time and acceptable resolution, making it suitable for routine analysis of Lobeglitazone samples. In this method a linear calibration curve was obtained within the concentration range of 10–60 µg/mL.

The LOD was calculated using the standard deviation of the Y-intercept of the regression line, and it was found to be 0.8 µg/mL. The LOQ was also derived from the regression line and was found to be 2.5 µg/mL. The LOD represents the lowest concentration of Lobeglitazone that can be reliably detected, while the LOQ is the lowest concentration that can be accurately quantified with acceptable precision.

The precision of the method was assessed, and the RSD (relative standard deviation) values were found to be less than 2.0% for both the method precision and instrument precision. This indicates that the HPLC method is precise and provides consistent and reliable results with minimal variability. The accuracy of the method was considered satisfactory because the mean recovery percentage fell within an acceptable range (usually 99.78–101.31% for Lobeglitazone). Overall, the developed method demonstrated good accuracy, precision, and sensitivity, making it

suitable for reliable quantification of Lobeglitazone in various samples within the specified concentration range.

Moreover, the method's robustness was validated through deliberate modifications of several chromatographic parameters, such as flow rate, wavelength, temperature, and composition of the mobile phase. Despite these changes, there were no significant alterations in peak areas or retention times, indicating the method's ability to provide consistent and reliable results under different conditions.

In comparison to a previously reported bioanalytical method, the developed HPLC method was found to be superior in several aspects. It exhibited a shorter retention time, a higher theoretical plate count (which signifies better resolution), and a mobile phase composition that facilitated good separation of Lobeglitazone from other components. These improvements enhance the efficiency and accuracy of the analysis, making the developed method more desirable for routine quantification of Lobeglitazone in various samples.

Table 1: System suitability parameters for Lobeglitazone

S.No.	Parameter	Lobeglitazone	Acceptance criteria
1.	Retention time (RT)	2.157	--
2.	Theoretical plates (N)	3176.816	NLT 2000
3.	Tailing factor (T)	0.868	NMT 2.0
4.	Linearity range (µg/mL)	10-60	--
5.	Detection Limit (µg/mL)	0.8	--
6.	Quantification limit (µg/mL)	2.5	--
7.	Regression data: Slope	109.48	--
8.	Regression data: Intercept	214.1	--
9.	Regression data: Correlation coefficient	0.9996	--

CONCLUSION

The HPLC method was successfully developed and validated on a Shimadzu HPLC model (VP series) for the determination of Lobeglitazone. The developed method is novel for the

deterimination of drugs at a single wavelength, 20 µL injection volume, and Phenomenex Luna C18 (5 µm, 4.6*150mm) column. The method developed for Lobeglitazone was found to be simple, precise, sensitive, rapid, robust, and economical, which compiles the ICH guidelines. The analytical conditions developed with good resolution within a short analysis time. The %RSD for all parameters was found to be within the limit (less than 2%). Which indicates the method developed is suitable for the determination of Lobeglitazone in laboratories and for quality control purposes.

ACKNOWLEDGEMENT

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ABBREVIATIONS

RP-HPLC: Reverse phase high performance liquid chromatography; LOD: Limit of detection; LOQ: Limit of quantification; ICH: International Conference on Harmonization; UV: Ultraviolet detector; RSD: Relative standard deviation; RS: Related substances.

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The classical Biomarkers to Predict Diabetes Mellitus

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Abstract

Diabetes mellitus is metabolic disorders; depicted by elevated blood glucose levels ascribed to a futile, scanty or sojourns production of insulin. Enduring complications of the disease have been related to peripheral vascular problems, steering to cardiovascular diseases, stroke, diabetic retinopathy, nephropathy and foot. Precise monitoring of these complications and early therapy stages will allow improvement in prevention and treatment approaches. The availability of measurable, accurate and reproducible biomarkers allow the patient to receive timely enactment of personalized therapies and circumventing harmful blood sugar fluctuations that ultimately progress to life-threatening impediments. Profound knowledge of these biomarkers released by extracellular vesicles in metabolic diseases and other disease condition may guide the development of novel therapeutic approaches to restore the affected pathogenesis, rather than merely treating the symptoms.

With advent of method that can isolate (ultracentrifugation, affinity-based capture, size exclusion chromatography/filtration, polymer precipitation) and characterize (protein quantification, transmission electron microscopy, atomic force microscopy, ELISA, nanoparticles tracking analysis, flow cytometry, western blot) from body fluids have become a major diagnostic and prognostic biomarkers not only in diabetes, in other conditions like cancer, neurodegradative disease.

Introduction

Diabetes Mellitus will be a significant medical issue for the world in the coming days, with its greatest impact in developed countries on newly industrialized, developing nations and minority groups [1]. Diabetes would be escalated from 135 to 300 million worldwide by 2025, of which 93-97%) patients will be with type II diabetes. Centers for Disease Control, data indicates that 1 in 3 adults have prediabetes that is an intermediate stage and, 90 percent people were unaware of their condition. In 2019, the international federation for diabetes reported that the

worldwide prevalence of reduced glucose tolerance (IGT) in adults was 318 million and predicted to exceed 482 million by 2040 [2, 4]. The main concern is how can we identify prediabetes patients early, and how can we prevent diabetes progression? Identification of these prediabetes states and risk stratification resulting from novel biomarker insulin resistance will improve both diabetic and pre-diabetic clinical outcomes [3]. Diabetes Prevention Program has illustrated that changes in dietary habits, weight loss and exercise reduce the risk of diabetes progression [5]. So the tools to identify and raise awareness of an individual's prediabetes state require more time [6, 7].

Biomarkers used to diagnose prediabetes for clinical assessment and prevent chronic condition in diabetes [8, 9]. Genetics, peripheral insulin resistance, insulin secretion defects, lipotoxicity, glucotoxicity, amylin accumulation, impaired incretin release inflammation, oxidative stress, and decreased β-cell mass resulting in β-cell dysfunction are factors leading to prediabetic state [10-12]. Prediabetes includes impaired isolated fasting glucose (IFG) or impaired tolerance glucose (IGT) [13]. This chapter will thus enable a better idea of the course of the diabetes and therapeutic interventions.

Handy Novel Biomarkers

Adiponectin

It is a protein and adipokine, is developed from adipose tissue, has insulin-sensitizing, anti-inflammatory, and anti-atherogenic functions and is proven to be an independent diabetes predictor [14]. Adiponectin concentrations are inversely related to insulin resistance (IR), cardiovascular disease and obesity [15]. Lower adiponectin concentrations were determined even a decade before diabetes developed, or its problems notably in men. The levels of adiponectin in children of diabetic parents are inversely associated with risk of prediabetes and this effect is observed in either sex or ethnicity. Hyperinsulinemic clamp and intravenous glucose tolerance (IGT) test showed a direct correlation of the adiponectin levels [15].

Fetuin-A

Fetuin-A (FetA) is a liver-secreted glycoprotein, it associated with elevated risk of T2DM incidence [16]. FetA enhances lipid-induced Insulin resistance via the toll-like receptor 4 (TLR 4 is a transmembrane protein) an inflammatory signaling pathway resulting to inflammatory cytokine production. High-fat diet-fed and FetA knock down animal module has less TLR4-mediated signaling in adipose tissue causing IR, in this model FetA injection induces inflammatory signals and IR [17].

Inflammatory cytokine expression in adipocytes was induced by the presence of FetA and TLR4 both required for FFA (free fatty acid). Higher FetA correlates also with the risk of cardiovascular disease in IR-susceptible candidates. In conclusion, FetA acts as an endogenous ligand to TLR4 for lipid IR induction. Therefore FetA can serve as a novel therapeutic target for IR [18].

Amino acids:

Studies have shown correlation between amino acids and Prediabetes, Insulin resistance and obesity. Branched chain and aromatic amino acids are associated to obesity as well as serum insulin, and the loading of glucose decreases amino acid levels in individual's sensitive to insulin but not in individuals resistant to insulin [19]. This is because proteolysis suppression in skeletal muscles is mediated by insulin. A variety of metabolic impairments are associated with high fasting levels of branched chain amino acids (BCAAs: valine, isoleucine, leucine and other aromatic amino acids such as phenylalanine, tyrosine) in venous blood, including increased risk of type 2 diabetes (T2D). These different concentrations of circulating amino acids can be considerable predictive biomarkers for IR and T2DM [20].

α-Hydroxybutyrate (α-HB)

In liver α-Hydroxybutyrate (α-HB) is an oxidative product of amino acids like threonin, methionine, and glutathione [21]. Induced metabolic stress and lipid oxidation results in persistent shifts in glutathione synthesis leading to elevated levels of α-HB in Insulin resistant individuals [22]. It is represented by increased excretion of the urinary α-HB in Insulin resistant people. α-HB would be used as a biomarker to distinguish normal glucose tolerance insulin sensitive (NGT-IS) individuals from impaired glucose tolerance (IGT) and impaired fasting glucose (IFG) and NGT-IS individuals from individuals with normal glucose tolerance insulin resistant (NGT-IR) [23]. Thus the α-Hydroxybutyrate (α-HB) can be a promising and useful biomarker for prediabetes.

Lipoprotein(a)

Lipoprotein(a) synthesizes through liver. Elevated levels of LP(a) have been shown to be risk factor for Coronary heart disease development. Serum Lp(a) has inverse relationship with the prevalence of prediabetes and T2DM. The higher insulin levels may be responsible for reducing lipoprotein(a) levels in the body [24].

Triglycerides and high-density lipoprotein

Elevated serum triglyceride (Tg) levels have been associated with b-cell dysfunction and reduced insulin secretion in prediabetes [25]. Significant increases in levels of small, high-density lipoprotein 3 (HDL3) particles were noticed in prediabetics compared to HDL-C levels. HDL-C induces insulin secretion and low HDL-C promotes prediabetes progression to diabetes.

Ceramide

I R. mediate Cerami dealipid molecules [26]. It acts by diminishing phosphorylation by inhibiting the insulin action. It accumulates further in insulin-resistant tissues and induces inflammation by activating TNF-α. Studies have also shown that ceramide spreads coronary artery disease.

Ferritin and transferring

The storage and release of iron is regulated by an intracellular protein ferritin. High serum ferritin and transferrin saturation association with elevated risk of prediabetes and diabetes [27]. The catalytic iron mechanism promotes the synthesis of superoxide radicals molecules that cause hepatic dysfunction, and β-cell apoptosis that contributes to IR. Dietary iron restriction prevents diabetes from developing, and β-cell function loss. The ferritin threshold levels that correlate with IR, however, are not certain.

Mannose binding lectin serine peptidase and thrombospondin-1

MASP1 high levels discovered in prediabetes, diabetes and CVD. Elevated levels of FPG and 2 hour glucose associate positively with higher levels of MASP1. Other prediabetes markers, such as thrombospondin1 (THBS1) and glycosylphosphatidylinositolspecific phospholipase D1 (GPLD1), are also increased [28]. Thrombospondin has inflammatory properties, and contributes to increased prevalence of prediabetes.

Acyl-carnitine

In prediabetes, serum levels of acyl-carnitine are elevated. Although it is not clear what role acylcarnitine plays in Fatty acid oxidation (FAO) and its mechanism in IR. An abnormal FAO and mitochondrial function has been postulated to lead to accumulation of intermediate products such as acyl-carnitines that promote inflammation and IR [29].

MicroRNAs: The hidden player

MicroRNAs (miRNAs) are small, noncoding RNAs participating in post-transcriptional gene expression. These are involved in many biological processes such as growth, development,

differentiation, proliferation, and cell death [30]. Recently, miRNAs have been studied in pre-diabetes and found to be strongly correlated especially high levels of miR-192 and miR-193b. In animal studies, increased levels of both miRNAs i.e., miR-192 and miR-193b were observed with IFG and IGT, and directly linked with Tg levels and the fatty liver index. It's quite significant since prediabetes can be correlated with a fatty liver.

Some miRNAs significantly enhanced in T2DM are miR-9, miR-29a, miR-30d, miR-124a, miR-146a, and miR-375, all of which play an important role in dysfunction of the β cells. Such miRNAs adversely regulate insulin expression and secretion.

Inflammatory markers: The universal culprits

The high percentage of IL-6 and CRP is associated with a greater risk of developing diabetes. These inflammatory markers are helpful in identifying people at greater risk of developing T2DM. Changes to the tissue plasminogen-1 (PAI-1) activator are an independent predictor of diabetes incidence [31].

In the Gutenberg study, IL-18 levels increased in line with the advancement from prediabetes to diabetes. IL-1RA levels were found to be significantly bumped up even thirteen years before diabetes was diagnosed, and it starts to rise more extremely quickly approximately 6 years before diagnosis. The Whitehall research reported an increase in prediabetes IL-1RA in tandem with reduced insulin sensitivity, increased β-cell function, and 2-hour glucose levels, all occurring years before T2DM developed [32].

White blood cell count, fibrinogen, and hematological indices

Subtle measure an elevated WBC counts for worsening insulin action, insulin secretion and the risk of diabetes among Pima Indians. The neutrophillymphocyte ratio (NLR) has also been associated with increased incidence of both microvascular and macrovascular diabetes [33].

Conclusions and Prospective

Dysglycemia is a pathophysiological process which continues. It is explicitly underreported and brings threat a large number of people. It has been late in the evolution of T2DM, leading to micromacrovascular complications. β-cell function reduced significantly on the higher side of the "normal glycemic range," leading to exponentially rising glucose levels.

In order to predict progression to dysglycemia at the earliest, there is a vital need to identify and use delicate, accurate biomarkers. Interference at early stage could be more responsible to reconfiguration of way of living and antidiabetic dugs. The well-identified list of biomarkers in a

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medical care may offer forecasting of prediabetes and chronic condition of diabetes greater sensitivity and accuracy.

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Sustainability of Biodegradable Plastics

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- Petroleum-based plastics are the third highest used product extracted from petroleum. India has become one of the biggest centers of plastic usage with over 15,000 tons of plastic waste generated every year, of which only 60% is re-processed. Countries all over the globe have begun to take steps on curbing its usage. Bangladesh has prohibited plastic bags countrywide, Ireland has imposed a tax on plastic bags, while the UK and other European countries are contemplating about taxing them as well. Comparative Advantage of Bioplastics

There are a few alternatives to plastics that are gaining attention at a global level. Bioplastics is one such eco-friendly alternative to plastics, which could be an excellent replacement since their manufacturing results in fewer emissions of greenhouse gasses. Unlike plastics, bio-plastics are

made from organic biomass sources such as corn starch and sugarcane.

Popular Variants of Bioplastics

Unknowing to us, Bioplastics have been around for decades now with a notable historical usage in the Model T automotive parts that were designed by Henry Ford from corn starch and soybean oil ingredients. However, it needs to be noted that not all bioplastics are completely biodegradable. Some biological-based products can biodegrade in municipal composting facilities, or aquatic and landfill environments; others can only biodegrade in very specific environments, while some will not biodegrade at all.

Production of bioplastics starts with the collection of starch material plants, which produce them by absorbing CO2 during photosynthesis. This plant starch is fermented by using lactobacillus bacteria, and is converted into a long-chain carbon polymer (PLA). These PLA granules are then molded into small plastic pellets which are melted to make different kinds of objects and packaging material. On the other hand, Polyhydroxylalkanoate is a polyester produced by fermenting raw vegetable materials such as carbohydrates, vegetable oil or even glycerine. bacterial strains. It is specially extracted from bacteria such as pseudomonas.

Bioplastics companies in India

The market for bioplastics in India is no longer nascent with many industry players taking pioneering steps. Our country has the raw material biomass required for bioplastics in abundance. Combining this with the rising awareness among consumers, India could become the potential fulcrum for global behavior change in turning away from plastics. Quite a few manufacturing firms like Envigreen, Ecolife, Plastobags, Earthsoul India and Truegreen have come up with different forms of bioplastics.

Truegreen is a firm based out of Ahmedabad that started a manufacturing plant with a capacity of producing 5,000 tons of bioplastics every year.

Plastobags is an established company that primarily started in the business of conventional plastics but recently has diversified its product portfolio and expanded into bioplastics with a whole range of products from carry bags, hygiene gloves to disposable waste bags and security bag.

Ecolife is a firm based out of Chennai that produces bioplastics for industrial packaging. Their products also include bioplastics for industrial packaging with different varieties like perforation

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films and lamination films.

Envigreen is the latest startup entering the Indian bioplastics market established by a Qatar-based NRI, Ashwath Hegde. In 2016, Envigreen opened its operations in Bengaluru and its production facility is already capable of producing 1,000 tons of bioplastics every year.

The growth of bioplastics in India is a positive change in consumer behavior and with continued support from the government and the citizens themselves, the awareness about bioplastics can become even more widespread. Hopefully more pioneering bioplastic companies like Envigreen, Truegreen and Ecolife expand the Indian market and bring about the much needed change toward a greener environment.

SMART/STIMULI RESPONSIVE HYDROGELS

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Hydrogels are three-dimensional hydrophilic polymeric structures whose liquid component is water. They could be semisynthetic, artificial, or derived from nature. Extracellular matrix (ECM), the skin, mucous membranes, cartilage, meniscus, collagen, gelatin, tendons, and vitreous humour are among the several physiological structures in which they are found [1].

Stimuli responsive hydrogels, also known as smart hydrogels, exhibit responsiveness to diverse external stimuli. These gels can undergo reversible or irreversible changes in physical or chemical properties upon exposure to stimuli, enabling a highly controllable drug release pattern. This capability contributes to achieving precise drug administration and enhancing treatment effectiveness and safety, The smart hydrogels are capable of reacting to a wide range of chemical (pH, glucose, and ionic strength), biological (enzymes and antigens/antibodies), and physical stimuli (temperature, light, electromagnetic fields, pressure, and ultrasonic (US) radiation[2].

Thermo-responsive hydrogels are the most researched type of smart/stimuli-responsive hydrogels. One characteristic of these hydrogel solutions is their lower critical solution temperature (LCST). Hydrogels classified as light-sensitive react when exposed to light stimuli. They consist of a functional photoreceptive moiety and a polymeric structure. Their physicochemical properties shift in response to light [3].

Hydrogel systems classified as electro-magnetic-responsive react to small changes in electrical and magnetic fields by changing their properties (shrinking, swelling, or bending). Usually, these systems were studied as hydrogels of ionizable rich polyelectrolyte. The ability of

pressure-responsive hydrogels to react to known compressive stimuli is a unique feature that is particularly pronounced in hydrogels with cellular designs, nanofibrous structures, and hyper elastic properties. Ultrasound-responsive hydrogels have a variety of uses in areas like mixing, cleaning, and imaging. They react to sound stimuli or ultrasound stimuli that are present but not recognised by humans [4].

Because of their hydrophobic moiety, pH-responsive hydrogels show responsive swelling in water in response to changes in the pH of the surrounding environment. Various kinds of glucose-responsive hydrogels, such as vesicles, micelles, microgels, nanogels, and mesoporous nanoparticles, could be utilised. One of the most widely used techniques for creating glucose-responsive hydrogels is covalent bonding.Certain enzymes can cleave enzyme-responsive hydrogels made of biomolecules and peptide sequences, breaking the hydrogels' crosslinks. Changes in the gel swelling behaviour can be caused by these enzymes' catalytic activities on the substrate. Antibodies or antigen immobilised on a transducer to antigen or antibodies is the fundamental mechanism by which antigen/antibody-responsive hydrogels function. The concentration of the analytes determines how strong the signals are that are generated [5].

The benefits of injectable hydrogels—which can be used as scaffolds or as carriers of therapeutic agents like drugs, cells, and proteins—have drawn the attention of researchers in recent times. These advantages include cytocompatibility, non-invasive administration, tunable mechanical properties, high permeability, controllable degradability, and injectability. To effectively use these injectable hydrogels, a few key obstacles must yet be addressed.

Challenges and Future Perspectives:

Smart hydrogels exhibit the potential to enhance therapeutic outcomes through their sensitivity to various stimuli. One significant limitation is the safety of newly developed materials. Another limitation is the need for novel smart hydrogel systems that exhibit enhanced and precise stimuli responses in clinical trials. Despite numerous publications on stimuli-responsive hydrogel systems, only a handful has successfully transitioned to practical clinical use.

Addressing these limitations is vital to advancing the field of stimuli-responsive hydrogels. The creation of more intricate hydrogel structures, closely mimicking the natural cellular microenvironment, can be achieved by harnessing microfluidic systems or the revolutionary potential of 3D-printing technology. The development of smart hydrogel-based DDSs holds great promise for achieving precise and personalized medicine

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A REVIEW ON SELF-EMULSIFYING DRUG DELIVERY SYSTEMS FOR BREAST CANCEROUS TREATMENT

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ABSTRACT:

In order to develop hydrophobic medications, lipid-based drug delivery systems have shown to be a helpful tool. They allow us to improve biological membrane permeability while concealing active components from the harsh in vivo environment and enhancing bioavailability. One of the lipid-based formulation strategies that can be categorized as self-emulsifying drug delivery systems is their ease of production and capacity to offer a significant answer to the solubility issues that most anticancer medications have. The protective impact of these formulations over gastrointestinal tract enzymes allows us to develop an oral application platform, which is why SEDDS is used in the formulation of peptide protein therapeutics to overcome issues with in vivo stability. For the purpose of this work, we employed the lymphatic targeting anticancer peptide LyP-1 as a model molecule to aid in the solidification of SEDDS preconcentrates. Characterization investigations were carried out to assess the permeation-enhancing effect of these innovative formulations and refine the formulation parameters as lyophilization and spray-drying procedures were employed to produce solid SEDDS. In this present investigation discussed about brief introduction of SEDDS, advantages, formulation, evaluation, drugs used in breast caner treatment, and stages of breast cancer

KEYWORDS: Self-emulsifying drug delivery system, breast cancer, Co-surfactants, stages of breast cancer

INTRODUCTION: Self-emulsifying drug delivery systems (SEDDS), which are isotropic mixtures of oils, surfactants, solvents and co-solvents/surfactants, can be used for the design of formulations in order to improve the oral absorption of highly lipophilic drug compounds. Wide variety of nanocarrier systems are prepared from SEDDS, that appear to be the most appealing, at least from a present industrial standpoint, because their scaling and manufacture are very simple. In a proof of principle investigation, researchers were ready to build the first zeta potential altering SEDDS. But they were able to show that splitting phosphate groups from the surface of SEDDS

and altering zeta potential from negative to positive. the shift was rather slight, ranging from −1 to +1 mV in the best scenario. Moreover, excipients like octylamine, cetylpyridinium, or cetrimonium, can be included from a safety standpoint to have positive charges on SEDDs surface that was accessible after the cleavage of phosphate group. Furthermore, because both surfactants (cationic or anionic) were to be included in the same formulation, unwanted ionic interactions, including ion pairing, could not be ruled out.

Stages of Breast cancer: Four general types of breast cancer are identified such as ductal carcinoma in situ, which is a non-invasive cancer in which abnormal cells are found in the lining of the breast milk duct; invasive ductal carcinoma, which is an invasive cancer in which abnormal cancer cells forming in the milk ducts have spread beyond the ducts into other parts of the breast tissue; inflammatory breast cancer, which is an aggressive and rapidly growing cancer in which cancer cells infiltrate the skin and lymph vessels of the breast; and metastatic breast cancer, which is categorized as Stage 4 breast cancer and is characterized by rapid cancerous spread to other body parts, usually the liver, lungs, bones, or brain [1]. TNBC and HER2-positive breast cancer are a couple of the more specific forms.

Factors affecting of SEDDS:_ Dose and nature of drug and Polarity of the lipophilic phase

Advantages over conventional emulsion: Prolonged gastric residence, Improved intestinal solubility, Improved drug permeability, and Lipid-based oral delivery. Problems faced with SEDDS with Biopharmaceutical issues are Specificity and Excipient selection.

Criteria for selection of drug candidate for SEDDS:

1. The most important parameter for SEDDS formulation is the lipophilicity and hydrophobicity of a drug.
2. A drug's log P should preferably be ≥2.
3. The drug is formulated at a modest dose and should not be subjected to substantial first-pass metabolism.

Composition of SEDDS

Drug (API), Oils, Surfctaqnts, Co-surfactants

Oils: Corn oil, Olive oil, Sesame oil, Soyabean Oil, Peanut Oil, Hydrogenated Soyabean Oil Hydrogenated Vegetable oil

Surfactants: Polysorbate 20(Tween 20), Polysorbate 80(Tween 80), Sorbitan Monooleate(Span 80), Polyoxy 40 hydrogenated castor oil, Cremophor RH 40, D-alpha Tocopheryl, Poly ethylene Glycol.

Co-solvents: Ethanol, glycerin, Propylene glycol, PEG

Co-Surfctants: Span 20, Span 80, Capryol 90

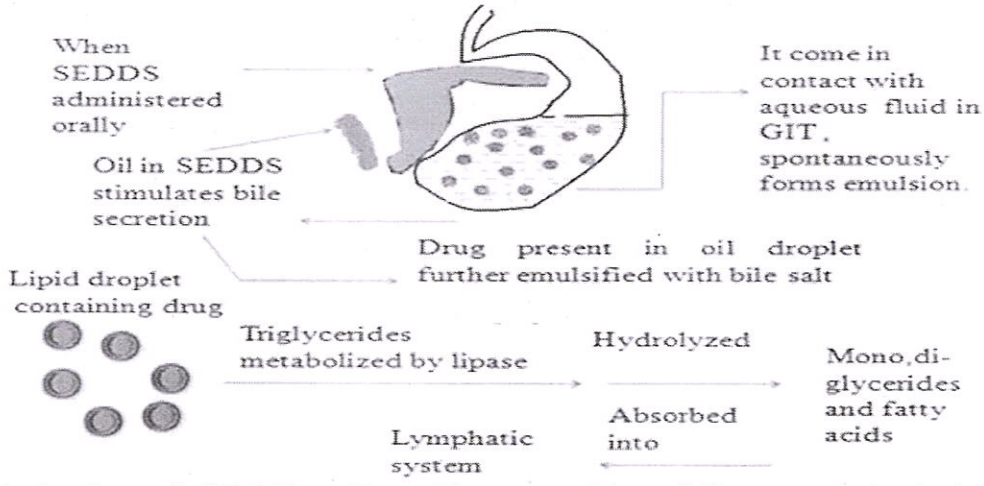
Viscosity Enhancers: Acetyl alcohol, tragacanth, beeswax and stearic acids etc.

Antioxidant Agents: α tocopherol, propyl gallate, ascorbic palmitate.

DIFFERENTIATION BETWEEN SEDDS AND SMEDDS:

SEDDS	SMEDDS
1. It is the mixture of oil, surfactant and drug.	1. It is a mixture of oil, surfactant, co-surfactant and drug.
2. Droplet size is 100-300 nm	2. Droplet size is less than 100 nm
3. It is turbid in nature.	3. It is transparent in nature.
4. It is thermodynamically not stable.	4. It is thermodynamically stable.
5. Ternary phase diagram are use in optimization	5. Pseudo ternary phase diagram are used for optimization.
6. Concentration of oil 40-80%	6. Less than 20%

Formulation of SEDDS: Emulsification Process: Mechanism of Self-emulsification and construction of Ternary Phase Diagrams such as Dilution method and Water Titration method.



Evaluation of SEDDS: Drug Content, Dispersibility Test, Rheological properties determination, Thermodynamic stability studies:, Heating cooling cycle, Centrifugation, Robustness to Dilution, Turbid Metric Evaluation, Self-Emulsification Time, In vitro Diffusion study, In vitro Dissolution technique, Liquefaction Time, Refractive index (R.I.) & Percent Transmittance

Drugs used in breast cancer treatment:

Pembrolizumab, 3.2.2. Avelumab, 3.2.3. Atezolizumab

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ZEBRA FISH AS A SUBSTITUTE ANIMAL MODEL : A Review

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ABSTRACT

The immune system's job in the body is defense. In the event of a bacterial, viral, or other foreign antigen invasion. The Zebra fish model has been widely used in both animal and human health research and, more recently, in aquaculture too. It follows the principle of 3Rs (replacement, reduction, and refinement) as required by a multiplicity of national and international regulatory bodies. Furthermore, the use of zebra fish model results in a reduction of time and use of resources when compared to those more established animals' models.

Keywords: Zebra fish, Vaccination

INTRODUCTION

Vaccination is used to enhance protection by increasing protection against illnesses brought on by microbes. During this process, a microbe, its toxins, or its surface proteins are recognized and destroyed by the body's defensive mechanism each time an invasion is detected. Vaccination is essential because it stimulates the body's defense mechanisms and fosters the growth of both individual and group immunity. Immunostimulants only act on specific (adaptive) immune responses, vaccinations, on the other hand, can act on nonspecific (innate) immunological responses. Furthermore, the role vaccines play in disease control as nontherapeutic and preventive strategies should be mentioned. As a result, the body can create antibodies that identify, alert, and kill pathogens or specialized cell responses that have a high degree of effectiveness and affinity in detecting a given antigen. The study of the use of vaccines in fish is an area of fast-growing. As aquaculture expands and the need to control pathogens becomes more pressing, the commercial vaccination of different varieties of fish is already a reality in many countries. It aids in the

prevention of diseases that could pose health risks to the shoal as well as in avoiding the economic losses due to mortality caused by infection. It reduces the contamination of water bodies by the excessive use of antibiotics, and the reduction of final fish product quality.

DISCUSSION

ZEBRAFISH MODEL AND VACCINES TESTING

Challenge trials are used in vaccine research to assess the vaccine's efficacy and safety against various diseases. Those are typically evaluated using mammal models, which are frequently inaccurate in simulating human diseases, time-consuming, and necessitate a higher number of animals. Analyzed to evaluate the innate (non-specific) or adaptive (specific) immune system response. As in mammals, Zebra fish has a well-maintained adaptive immune system composed of T and B lymphocytes that develop from the thymus and kidneys respectively. However, in relation to the development of memory lymphocytes, fish seem to have memory cells of the type B and T. As in humans, Zebra fish has recombination activator genes that control the rearrangement of gene segments V, D and J to produce the diversity of antibodies and lymphocyte receptors.

Organ histology, count, hematocrit, glucose, and immunological essays including serology, particular antibody titration, and agglutination. Furthermore, according to Bailone et al., toxicity studies including those for embryo toxicity, hepatotoxicity, neurotoxicity, endocrine toxicity, and geno toxicity can also be carried out using zebra fish.

One benefit of this model is that it follows OECD rules specifically for the safety assessment of chemical compounds (acute toxicity), which is completed in 96 hours. Furthermore, real-time observations enable the tracking of embryogenesis and the effects of vaccinations on heart, liver, neurological system, and endocrine systems, in addition to behavioral domains.

Vaccines should be evaluated using animal models before being tested on humans, animals, or pets to prevent harming or killing any of them, especially in the situation involving children, the elderly, and immunosuppressed organisms. Side effect reactions in humans may also be observed to be caused by other vaccines such as yellow fever, measles, mumps, rubella, chicken pox, diphtheria and tetanus. The most Common symptoms are seizures, severe allergic reactions, meningitis, encephalitis. Thus, the Zebra fish model has the advantage of a researcher to follow in real-time the fish's development from its embryogenesis to full organ development which is reached about 36 h after fertilization. This allows for a vaccine's effect on all the major organs

precursors to be closely studied such as using immune histology.

Range of drugs used in human medicine with similar results of toxicity (LC50) in zebra fish

DRUG	USED AS
Geladanamycin	Antibiotic
Ethanol (Ethyl alcohol)	Antiseptic
Dexamethasone (Corticosteroid)	Antiseptic
Acetaminophen	Anti-inflammatory
Doxorubicin	Analgesic/ antipyretic
Cyclosporine A	Immunosupressor drug
Didemnin B	Antiviral / Immunosupressor

BENEFITS OF VACCINATION EXPERIMENTS USING THE ZEBRAFISH MODEL

Zebra fish have additional biological benefits over other animals, such as high fertility, external fast development, optical transparency, and fertilization. Furthermore, the highly developed immune system of zebra fish is strikingly comparable to that of humans. Numerous mutants were identified thanks to the advancement of specialized cloning, mutagenesis, and transgenesis procedures. Zebra fish mutants for sale.

Regarding the administration of vaccines, in view of the different routes of applications presented in animals and humans, the zebra fish model still allows the immunization of embryos, facilitated by its transparency, using glass needles.

In zebra fish larvae, a rapid systemic infection can be initiated by direct microinjection of a bacterial suspension into the bloodstream. Alternatively, a more localized infection may be induced by the injection of microbes into the muscle tail or the hindbrain ventricle. For high transfer rate, the microbes can be readily injected into the yolk for the first few hours after fertilization. However, it is important to keep in mind that the yolk lacks immune cells, and therefore the bacteria are able to grow freely before invading the larval tissues.

Vaccines against fish in aquaculture, as in any other animal production, illness outbreaks that cause fatalities must be prevented. Immunization is crucial for the system. As a result, the

outcomes of research done on zebra fish may help to improve the use of vaccinations for that aim Aquaculture vaccine development has been a significant step in ensuring a consistent, high-standard, safe animal health production system. Zebra fish models have emerged as the model of choice for fish immunization studies against a number of diseases, including viruses and bacteriosis, which are global causes of aquaculture losses. They observed that the immune response was increased after vaccination.

Guo et al. also studied Edwards iella tarda which is important intracellular pathogenic bacterium that causes the infectious disease Edwardsiellosis in fish. They proved that live E. tarda vaccine enhanced innate immunity by metabolic modulation in zebra fish.

Ye et al. also investigated the vibriosis-causing bacterium Vibrio anguillarum, noting the protective function and maternal transmission in zebra fish progeny after administering a live, attenuated V. anguillarum immunization to the brood stock. They demonstrated how immunization with a live, attenuated vaccine might protect early embryos and larvae against the onslaught of particular pathogens while also enhancing the development of immune cells.

ANIMALS AND HUMAN VACCINES

The zebrafish model has been used not only in aquaculture, but also in veterinary and human medicine. So far, it has become one of the major model systems used in modern biomedical research. According to Torracaet al., zebra fish can be also used as a model for pathogenesis and host defense, modeling many human diseases, such as tuberculosis, Staphylococcus aureus and Shigella infection, among others, as well as model to investigate immune cells, infection and inflammation of different kind of human diseases. Zebra fish could also be used as a model for Tuberculosis which is a devastating infectious disease worldwide and with no current prospect of efficient prevention. Tuberculosis is an infectious disease caused by bacilli from the Mycobacterium tuberculosis complex. An infection by Mycobacterium marinum in adult zebra fish resembles that of human tuberculosis, as demonstrated by Myllymäki et al. Other species of Mycobacterium have also been studied, such as M. bovis and M. abscessos M. bovis is most common in cattle, but also affects humans. M. bovis Bacillus Calmette-Guérin vaccine is currently available as a prophylactic tool for preventing the disease. It has been shown to be efficient in preventing disseminated forms of tuberculosis in children; however, its efficiency is limited in areas where individuals have had Prior exposure to environmental myco bacteria, and its efficacy. The models enhance the search for new therapeutic drugs by allowing the screening of the host and

bacterial variables that influence the disease.

CONCLUSION

The creation of novel, safe vaccines against illnesses for which there is now no preventative treatment or for which the efficacy of current vaccinations is questionable is made possible in large part by this paradigm. Therefore, screening tests that were previously conducted using zebra fish have been shown to be successful in the preliminary stages before testing with mammals. It is therefore anticipated that its use will increase in the upcoming years.

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DATA SCIENCE IN HEALTHCARE: HOW IT IMPROVES CARE

Data Science in Healthcare: Applications, Roles and Benefits

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Quantified health is a relatively new movement that integrates data directly from consumer wearables (pedometers, Fitbits, Muse headbands, etc.), blood pressure cuffs, glucometers, and scales into EMRs through smartphones (Apple's HealthKit, Google Fit, and Samsung Health are a few examples), and can pick up on warning signs faster by tracking changes in behavior and vital signs.

- ***Drug Discovery***

It costs up to $2.6 billion and takes 12 years to bring a drug to market. Big data allows scientists to simulate the reaction of a drug with body proteins and different types of cells and conditions, so that it has a much higher likelihood of gaining Food and Drug Administration approval and curing diverse patients (e.g., people with certain mutation profiles).

- ***Disease Prevention***

The best way to transform healthcare is to recognize risks and recommend prevention plans before health risks become a major issue. Through wearables and other tracking devices that take into account historical patterns and genetic information, it's possible to recognize a problem before it gets out of hand.

- ***Diagnosis***

One of the most effective uses of data science in healthcare is medical imaging. Computers can learn to interpret MRIs, X-rays, mammographies, and other types of images, identify patterns in the data, and detect tumors, artery stenosis, organ anomalies, and more.

- ***Treatment***

With more data on individual patient characteristics, it is now possible to deliver more precise prescriptions and personalized care. Data science is also helping with the emerging field of gene therapy, which involves inserting genetic material into cells instead of traditional drugs to compensate for abnormal genes.

- ***Post-Care Monitoring***

After any type of surgery or treatment, there is the risk of complications and recurring pain, which can be difficult to manage once the patient leaves the hospital. Remote in-home monitoring helps

doctors stay in touch with patients in real time while freeing limited and costly hospital resources.

- ***Hospital Operations***

Hospitals are cost-sensitive and face complex operational problems, such as how many staff to assign at certain hours to maximize efficiency, how to ensure enough hospital beds are available to meet patient demand, and how to enhance utilization in the operating room. Predictive analytics can optimize scheduling and even go so far as to tell hospital staff which beds should be cleaned first and which patients may face challenges during the discharge process.

Analytics software can streamline emergency room operations, ensuring that each admitted patient goes through the most efficient order of operations. Emory University Hospital used data science to predict the demand for different types of lab tests, cutting wait time by 75 percent.

Furthermore, business intelligence can streamline billing, identify patients who are at risk of late payments or financial difficulties, and coordinate with financial, collections, and insurance departments.

- ***What's Next for Data Science in Healthcare***

Now is the right time for a data-driven healthcare industry and many players are participating in this change, including large biotech and pharmaceutical companies, payers and providers, hospitals, university research centers, and venture-backed startups. Data science can save lives by predicting the probability that patients will suffer from certain diseases, providing AI-powered medical advice in rural and remote areas in underserved communities, customizing therapies for different patient profiles, and finding cures to cancer, AIDS, Ebola, and other terminal diseases.

As in any industry, there are concerns about the use of data science in healthcare. From a logistical standpoint, data often lives in disparate states, hospitals, and administrative units and it is challenging to integrate it into one cohesive system. Many patients are additionally concerned about the protection and privacy of their healthcare information, especially as companies like Google face lawsuits for using sensitive health information in ad targeting. Although data science can solve the shortage of doctors in many countries, some worry about outsourcing the important doctor-patient relationship to computer algorithms and machines.

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EVALUATION OF *ORYZA SATIVA* (VAR. JOHA RICE) FOR ANTI HYPERLIPIDEMIC ACTIVITY IN RATS

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ABSTRACT:

Abstract: The present study evaluated the anti-hyperlipidemic activity of the ethanolic extracts of *Oryza sativa* (var. Joha rice) (EEJR) on blood cholesterol of albino rats. Ethanolic extract of joha rice was administered at doses of 200 and 400 mg/kg body weight respectively on cholesterol induced hyperlipidemic rats for 7 days. Hyperlipidemic rats had much reduced body weight than normal rats. Administration of the extracts at the dose of 200 & 400 mg/kg body wt. /day produced a significant effect on lipid profile, which had shown anti hyperlipidemic activity on cholesterol induced hyperlipidemic rats. Cholesterol induced hyperlipidemic rats treated with Ethanolic extract of joha rice (200 & 400 mg/kg) significantly reversed all these changes to near normal. These results suggest that Ethanolic extract of joha rice possess anti hyperlipidemic activity in cholesterol induced hyperlipidemic rats.
Key words: joha rice, hyperlipidemia, cholesterol, albino rats, lipid profile.

INTRODUCTION:

Cardiovascular disease is the leading cause of mortality all over the world and is a major health concern of the public nowadays. Hyperlipidemia is described as the contributing risk factor for cardiovascular disease (Brown & Goldstein 1986). Hyperlipidemia is also the primary cause of atherosclerosis, ischemic cerebrovascular disease, coronary heart disease and peripheral vascular diseases (Hardman & Limbard 2001). Hyperlipidemia is characterized by cluster of abnormalities like elevated serum total cholesterol, serum triglyceride, low density lipoprotein-cholesterol levels and reduced high density lipoprotein cholesterol levels. It is well known that various factors such as lipid abnormalities, oxidative stress (Yokoyama 2004) and inflammation (Hansson 2005) have been associated in the development of atherosclerosis and subsequent cardiovascular diseases. There exists a wide consensus that hyperlipidemia in human and animals is produced by the influence of dietary cholesterol. Diet plays a pivotal role in maintenance of ideal body weight, body fat and normal levels of blood lipids (Loo et al 1991). Numerous research reports have been demonstrated in understanding the pathophysiology of hyperlipidemia. Growing evidence suggests that prevention or treatment of atherosclerosis and cardiovascular diseases is possible through targeting hyperlipidemia by diet or drugs (LaRosa et al 1990). restricting the blood supply to the heart. This phenomenon is known as atherosclerosis. Higher Hyperlipidemia disease has afflicted humankind since antiquity. In 2002, coronay heart Epidemiological evidence strongly supported the positive correlation between blood lipids, hyperlipidemia and its complications, mainly CHD. This relationship has been shown between and within cultures. The hyperlipidemia is traditionally defined as conditions in which the concentration of *cholesterol* or *triglyceride*-carrying *lipoproteins* in plasma exceeds an arbitrary normal limit. These lipoproteins deposit in the interstitial space of arteries arising from aorta, deposition of lipoproteins completely blocked the blood supply to the heart, and thus myocardial infarction (MI) occurs, which is commonly known as heart attack.

Causes

The predisposing factors associated with hyperlipidemia constitute (Bethesda 1991; Marshall 1992; Lipmann et al 2000) 1. Elevated low density lipoprotein-cholesterol (LDL-C) levels and decreased high density lipoprotein- cholesterol (HDL-C) levels

2. Age (male > 45 years; female > 35 years)
3. Family history of premature death
4. Diet rich in saturated fats and cholesterol
5. Diabetes Mellitus
6. Hypertension
7. Hypothyroidism
8. Cigarette smoking and alcohol abuse
9. Physical inactivity
10. Obesity or overweight
11. Overactive adrenal gland
12. Increased levels of c-reactive proteins
13. Increased Lipoprotein (a) levels
14. Liver and kidney problems
15. Certain drugs (Birth control pills)

Types of Hyperlipidemia

Hyperlipidemia is broadly classified into two types:

Primary Hyperlipidemia and Secondary Hyperlipidemia

Primary Hyperlipidemia This occurs as an outcome of high consumption of diet rich in saturated fats and cholesterol or because of some genetic defect and heredity factors (Marshall 1992; Tripathi 2008) Fredrickson classification of hyperlipidemia is given below, Type I: Buerger Gruetz syndrome primary hyperlipoproteinemia or Familial chylomicronemia Type II a: Polygenic Hypercholesterolemia or Familial hypercholesterolemia Type II b: Combined Hyperlipidemia Type III: Familial Dysbetalipoproteinemia Type IV: Endogenous Hyperlipidemia Type V: Familial Hypertriglyceridemia 1.1.2.2 Secondary Hyperlipidemia This occurs as a result of other metabolic disturbances. Several disease states are associated with secondary hyperlipidemia which includes 4 diabetes mellitus, hypothyroidism, pregnancy, alcohol abuse, chronic renal failure, myeloma and obstructive liver disease (Marshall 1992).

On the basis of causing factor

Familial (Primary) hyperlipidemia–On the basis of causing factors hyperlipidemia can be designated as either primary or secondary. According to Fredrickson familial hyperlipidemia is classified into five types (table 2) on the basis of electrophoresis or ultracentrifugation pattern of lipoproteins.

Type I –Raised cholesterol with high triglyceride levels.
Type II–High cholesterol with normal triglyceride levels.
Type III –Raised cholesterol and triglycerides.
Type IV –Raised triglycerides, atheroma and uric acid.
Type V –Raised triglycerides.

This classification was later adopted by WHO. This method does not directly account for HDL and also does not distinguish among the different genes that may be partially responsible for some of these conditions. It remains a popular system of classification but is considered dated by many.

Causes of hyperlipidemia

A diet rich in saturated fat and cholesterol increases blood cholesterol and triglyceride levels.

Other disorders as obesity, diabetes mellitus and hypothyroidism increase the risk of hyperlipidemia.
Smoking and not exercising may lead to hyperlipidemia [40].
Excessive use of alcohol also increases the risk of hyperlipidemia.
Certain drugs as steroids and β–blockers may cause hyperlipidemia.
Hereditary factor is also one of the common causes for hyper-lipidemia.
In some cases hyperlipidemia occurs during pregnancy.
Lipoprotein lipase mutations.

Symptoms of hyperlipidemia

Hyperlipidemia usually has no noticeable symptoms and tends to be discovered during routine examination for atherosclerotic cardiovascular disease.
Symptoms may include chest pain (angina), heart attack or stroke.
When levels are exceedingly high, cholesterol may be deposited in tendons or just beneath the skin under the eyes.
Swelling of organs such as liver, spleen or pancreas.
Blockage of blood vessels in brain and heart.
Higher rate of obesity and glucose intolerance.
Pimple like lesions across the body.

MATERIALS AND METHODS:

Evaluation Of Anti Hyperlipidemic Activity:

Animals:

Healthy eight-week old female Wister albino rats (130 to 160 g) were randomly assigned to control and treated groups (six animals per group/cage). They were maintained in standard environmental conditions (22 ± 2°C, 12:12 h dark/light cycle, humidity: 45 to 50%) frequent air change and had free access to tap water and food. All animals were obtained from the animal house. All procedures used in the present study followed the "Principles of Laboratory Animal Care" and were approved by the Animal Ethics Committee of our University.

Cholesterol supplemented diet:

Hypercholesterolemia was induced using earlier modified method of Onody et al., (2003). Briefly, cholesterol (2% w/w) powder was Olorunnisola et al. 13499 thoroughly mixed with crushed pellet diet and reconstituted with water and allowed to dry properly to prevent microbial contamination.

Experimental designs:

Experimental animals were divided into the following groups after two weeks of acclimatization. Each group comprised of 6 animals.

Group 1: Control rats fed with normal pellet diet for 4 weeks by orally gavage.

Group 2: Rats fed with cholesterol mixed pellet diet by orally gavage.

Group 3: Rats fed with cholesterol (2% w/w) mixed pellet diet and Joha rice extract (200mg/kg) by orally gavage.

Group 4: Rats fed with cholesterol mixed pellet and Joha rice extract (400mg/kg) by orally gavage.

Group 5: Rats fed with cholesterol (2% w/w) mixed pellet diet together with standard drug (Lovastatin) (30 mg/kg) by orally gavage.

Biochemical determinations:

Assessment of lipid profile and biochemical parameters

Blood samples were collected from overnight fasted rats using the method described by Yakubu et al. (2005). Briefly, under ether anesthesia, the neck was quickly cleared of fur and skin to expose the jugular veins. These animals were thereafter made to bleed through their cut jugular vein and their blood was collected with lithium heparinized tubes. Total cholesterol, triglycerides, low density lipoprotein (LDL), very low density lipoprotein (VLDL), high density lipoprotein-cholesterol (HDL-C) levels, aspartate amino transferase, alanine amino transferase, alkaline phosphatase, total bilirubin, lactate dehydrogenase, gamma glutamyl transferase (gGT) and glucose were determined in the blood using piccolo automated chemistry analyser.

a) Serum Cholesterol Estimation

Serum cholesterol was estimated by CHOD/POD method with the help of Clinical Chemistry Analyzer (Metro Lab, 1600 DK-R) CHOLESTROL STABLE REAGENT (Swemed Diagnostics, Bangalore).

Principle

Cholesterol reacts with hot solution of Ferric perchlorate, Ethyl acetate and sulphuric acid (Cholesterol Reagent) and gives a lavender coloured complex which is measured at 560 nm. The enzymatic reaction sequence employed in the assay of cholesterol is as follows:

$$\text{Cholesterol Esters} + H_2O \xrightarrow{\textbf{Cholesterol esterase}} \text{Cholesterol} + \text{Fatty acid}$$

$$\text{Cholesterol} + O_2 + \text{4-Aminoantipyrine} + \text{Phenol} \xrightarrow{\textbf{POD}} \text{Chinoimine (Red Coloured Complex)}$$

Procedure

To 1000 µl of the reagent, 10 µl of standard cholesterol (100 mg/dl) was added and incubated for 10 min at 37 °C. This incubated mixture was aspirated and concentration of standard was calibrated to show a value of 100 mg/dl. The fasting serum cholesterol was estimated by adding 10 µl of the serum sample to 1000 µl of the reagent, mixed well and incubated at 37 °C for 5 min. This incubated mixture was aspirated and absorbance recorded against a reagent blank at 505 nm using Clinical Chemistry analyzer.

- **Serum HDL Cholesterol Estimation**

Principle

The chylomicrons, VLDL (very low density lipoproteins) and LDL (low density lipoproteins) are precipitated by addition of magnesium chloride. After centrifugation the supernatant fluid contains the HDL-fraction (high density lipoproteins). This is assayed for HDL cholesterol using cholesterol reagent with the help of Clinical Chemistry Analyzer (Metro Lab 1600 DK-R) HDL REAGENT (Swemed Diagnostics, Bangalore).

Procedure

Step-1

To 500 µl of the HDL reagent was added to 250 µl of standard and mixed well, kept to stand for 10 min at 15-25 °C and centrifuged for 15 min at approx. 4000 rpm. Determined the cholesterol concentration of the supernatant within 1 h after centrifugation.

Step-2

From the supernatant sample 100 µl was taken and added to cholesterol reagent. Mixed and incubated reagent blank, standard and sample for 10 min at 20 °C or 5 min at 37 °C, then measured

the absorbance of sample against reagent blank within 1 h.

- **SGOT estimation**

Serum SGOT was estimated by Modified IFCC method with help of clinical chemistry analyzer (Metro Lab, 1600 DK-R) SGOT LIQUID STABLE REAGENT (Swemed Diagnostics, Bangalore).

Principle

SGOT catalyses the transfer of amino group from L-aspartate to 2- oxoglutarate forming oxaloacetate and L-glutamate. The rate of this reaction was monitored by an indicator reaction coupled with malate- dyhydrogenase (MDH) in which the oxaloacetate formed was converted to malate in the presence of reduced nicotinamide adenine dinucleotide (NADH). The oxidation of NADH in this reaction was measured as a decrease in absorbance of NADH at 340 nm, which was proportional to SGOT activity.

The enzymatic reaction sequence employed in the assay of SGOT is as follows:

$$\text{L-Aspartate} + \text{2-oxoglutarate} \xrightarrow[\text{MDH}]{\text{ASAT}} \text{Oxaloacetate} + \text{NADH} + \text{Glutamate} + \text{H+ L-Malate} + \text{NAD}^+$$

Procedure

To 400 µl of R1 reagent add 100 µl of R2 reagent (total of 500 µl) add 50 µl of the serum sample and mix well take the reading after 60 sec.

- **SGPT Estimation**

Serum SGPT was estimated by Modified IFCC method with help of clinical chemistry analyzer (Metro Lab, 1600 DK-R) SGPT LIQUID STABLE REAGENT (Swemed Diagnostics, Bangalore).

Principle

SGPT catalyses the transfer of amino group from L-alanine to 2-Ketoglutarate with the formation of pyruvate and L-glutamate. The pyruvate so formed is allowed to react with NADH to produce lactate. The rate of this reaction is monitored by an indicator reaction coupled with LDH in the presence of NADH (Nicotinamide adenine dinucleotide). The oxidation of NADH in this reaction was measured as a decrease in the absorbance of NADH at 340 nm, which was proportional to SGPT activity.

The enzymatic reaction sequence employed in the assay of SGPT is as follows:

$$\text{L-Alanine} + \text{2-oxoglutarate} \xrightarrow[\text{LDH}]{\textbf{ALAT}} \text{Pyruvate} + \text{NADH} + \text{H+ D-Lactate} + \text{NAD}^+$$

Procedure

To 400 µl of R1 reagent add 100 µl of R2 reagent (total of 500 µl) add 50 µl of the serum sample and mix well take the reading after 60 sec.

Statistical analysis:

Values were given as means ± standard deviation (mean ± SD). Data was statistically analyzed by using one-way analysis of variance (ANOVA).

Results of Anti hyperlipidemic activity:

The lipid profiles in control and experimental rats are depicted in Table- 1 in cholesterol induced hyperlipidemic rats. The hyperlipidemic control rats (Group II) showed significant increase in serum triglycerides, Total cholesterol, very low density lipoproteins (VLDL), low density lipoproteins (LDL), and High density lipoproteins (HDL) when compared with normal (Group I). Standard lovastatin (Group III) also reduced triglycerides, Total cholesterol, very low density lipoproteins (VLDL), low density lipoproteins (LDL), and increased High density lipoproteins (HDL) when compared with normal (Group I).The ethanolic extract showed significant decrease ($p<0.001$) in Total cholesterol, LDL, VLDL, Triglycerides and significant increase ($p<0.001$) in HDL when compared with hyperlipidemic control group (Group II). All these effects were observed on 8th day. The present experimental result indicated that ethanolic extract of Joha Rice exhibited a potent blood glucose lowering properties in cholesterol induced hyperlipidemic rats. The results were shown in **Table- 1** and values were plotted in **Figure-1**

Table 1. Effect of EEJR on Lipid Profile in Cholesterol Induced Hyperlipidemic Rats

S.NO	GROUP	0N 7TH DAY						
		TCH	TG	IIDL	LDL	VLDL	SC	BU
1	NORMAL CONTROL	94.17±0.477	98.0+0.632	40.67±0.666	31.5±1.232	21.5±0.763	1.11±0.047	28.0±0.730
2	HYPERLIPI-DEMIC CONTROL	134.7±1.667 a***	139.0±0.894 a***	19.8±1.352 a***	54.5±2.141 a***	60.5±1.057	2.66±0.055 a***	48.33±0.802 a***
3	LOW DOSE	90.67±0.494 b***	98.33±0.333 b***	42.5±0.846 b***	33.17±1.493 b***	22.67±0.843 b***	1.35±0.042 b***	27.83±0.477 b***
4	HIGH DOSE	83.5±0.806 b***	93.5±1.765 b***	41.5±0.670 b***	30.67±0.494 b***	19.83±0.600 b***	1.01±0.060 b***	24.0±0.365 b***
5	STANDARD	87.83±0.749 b***	97.17±1.662 b***	40.0±0.577 b***	31.83±0.792 b***	22.33±1.085 b***	1.15±0.042 b***	27.17±0.600 b***

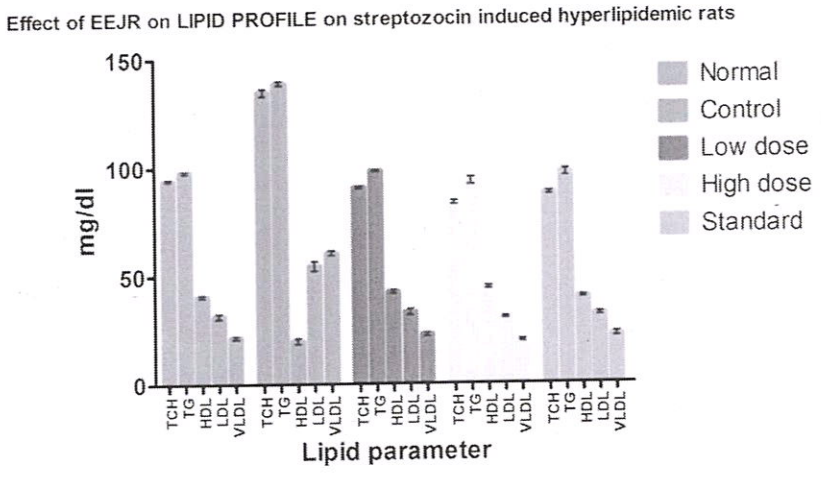

Fig 1. Effect of EEJR on Lipid profile in Cholesterol induced Hyperlipidemic rats

DISCUSSION:

Discussion of anti- hyperlipidemic activity:

Lipoproteins are one of the most susceptible targets of free radicals. The oxidative destruction is known as lipid peroxidation and may induce many pathological events.

As the EEJR was found to possess antioxidant potential, it was evaluated for antihyperlipidemics activity also. The hyperlipidemia was induced by HFD containing high level of cholesterol. The treatment group received standard drug Lovastatin (20 mg/kg b.w.) and EEJR was carried out simultaneously along with HFD for a period of seven days. The blood serum collected on 8th day suggested increase in the level of TC, TG, LDL and decrease in HDL level in negative control i.e., the group that received only HFD. The estimation of these parameters in the standard group (HFD + Lovastatin) and test group (HFD + EEJR) revealed that the level of TC, TG, LDL were decreased and level of HDL was increased than the negative control group in a significant manner when evaluated statistically by using the software Graph Pad Prism 5.0 ANOVA study was done for the results of the level of parameters obtained by using Dunnet t-test.

The standard drug decreased the level of TC, TG, LDL and VLDL and increased the level of HDL than the negative control.

The Test drug (EEJR) decreased the level of TC, TG, LDL and VLDL and increased the level of HDL than the negative control. The differences were found to be significant.

Thus it can be reported that the ethanolic extract of *Oryza sativa* (var. Joha rice) possess significant antihyperlipidemic activity.

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Herbal nanomedicines: Current Developments, Challenges, Prospects, and Regulatory Summary

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Plant-based Traditional Chinese, Ayurvedic, Siddha, and Unani. Vegan blockbusters make up 30%. Geography, biodiversity, and seasonal variation on net content limit formulation reproducibility; curcumin, boswellic acids; lack of information on herbal drug uses in modern diseases like cancer, viral infection, multidrug-resistant microbial infections, diabetes, obesity, and cardiovascular disorders. Natural therapies outperform tablets, syrup, and decoctions. Nanotechnology-based herbal medicine delivery is effective. It has improved targeted, controlled, and sustained drug delivery, artificial implants, tissue/organ imaging, biosensors, nanorobotics, and medicine delivery. Nanotechnology was coined by Norio Taniguchi at Tokyo Science University in 1974. Drugs with the prefix "nano" represent particles 10–1000 nm. However, lymphatic system stimulation may excrete 200 nm or bigger particles via blood circulation. Nanoparticles 10–200 nm were projected to deliver drugs effectively. Nanoparticles travel easily throughout the body due to their chemical, electrical, structural, magnetic, mechanical, and biological capabilities. Metal, polymeric, phytosome, liposome, ethosome, nanoemulsion, micelles, and dendrimer nanomedicines aid herbal cures. Traditional Ayurvedic medicine uses bhasma nanoparticles. In "Bhasmikarana," metal ions and herbal medications are transformed into metal ion-nanoparticles to make Bhasma (ash). Metal nanoparticles provide greater absorption, stability, and body compatibility. The Dhatu Bhasma is made from silver (Ag, Rajata), mercury (Hg, Parada), zinc (Zn, Yasada), iron (Fe, Loha/Aayasa), tin (Sn, Vanga), lead (Pb, Naga/Sisaka), copper (Cu, Tamra), and gold (Au, Swarna). The bhasmikaran method decreased metal particle size to 5–50 nm, according to SEM and TEM study of Bhasma. Many biologically active herbal nanoparticles have been patented. The recent decade has seen a surge in herbal nanomedicine patents promising enhanced solubility, bioavailability, sustainability, and targeted delivery. Concluded Nanoformulation possibility for phytoconstituent extract/enriched fraction solubility and permeability (like BCS medicines). Turmeric, andrographolide, piperine, boswellic acids.

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POTENTIALLY INAPPROPRIATE MEDICATIONS AMONG OLDER ADULTS IN A PRIVATE TEACHING HOSPITAL IN TELANGANA STATE, INDIA

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ABSTRACT

Background:

Potentially inappropriate medications (PIMs) is an indispensable concern that contributes to serious medication-related problems in the elderly. Notably, the problem escalates as the numerous of medications increase (polypharmacy), which is quite common due to old age and multiple comorbidities. Hence, medication errors, adverse events and drug interactions are prevalent. The outcome measures of this study were to investigate PIMs use in older adults in a private teaching hospital and the associated factors.

Methods:

A prospective, cross-sectional study was conducted among all patients aged ≥ 60 years in a private teaching tertiary hospital. "The 2023 AGS Beers Criteria®" was used to identify the prescriptions containing PIMs. The factors associated with the PIMs usage like age, gender, average monthly income, comorbidities, polypharmacy and drug interactions were assessed using descriptive statistics and predictive factors were identified using logistic regression.

Results:

The study included 295 older adults with a mean age of 67.25 ± 6.2 years. About 78% of the study participants were males, 45% in the income category of 20 – 30K; the mean comorbidities were 0.93(0.92) ranging from 0 to 4; about 47% of prescriptions were prescribed with 9 – 12 medications; about 42% of prescriptions contained atleast two PIMs in the prescription, and the prevalence of mean drug interactions was 0.64(0.48) ranging from 0 to 3. We found significant associations among age categories and gender/number of drugs prescribed. The co-morbidities associated with various disease conditions showed statistically significant results (p <.001). Drug interactions among cardiovascular and respiratory diseases showed significant associations (p <.05). General Medicine [AOR=1.637, 95% CI: 1.016-2.637], Pulmonology [AOR= .365, 95%

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CI: 0.163-0.820], Cardiology [AOR= .349, 95% CI: 0.161-0.755] and Orthopaedic departments [AOR= 8.234, 95% CI: 0.341-9.221] are the major associated factors of PIMs.

Conclusions:

This study identified crucial areas that should be addressed for future interventions to improve the QOL of elderly population who are at risk of PIM's through encouraging physicians for deprescribing, establishing geriatric prescribing guidelines and educating the prescribers to follow prescribing guidelines.

Keywords: Potentially inappropriate medications, older adults, Beers Criteria, Inappropriate prescribing, polypharmacy

PHARMACEUTICAL PACKAGING TECHNOLOGY

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Packaging

A Pharmaceutical Package container is an article or device which contains the Pharmaceutical Product and the container may or may not in direct contact with the product. The container which is designed for pharmaceutical purpose must be stable.

Ideal Qualities of a Pharmaceutical Package.

1. It should have sufficient mechanical strength so as to withstand handling, filling, closing and transportation.
2. It should not react with the contents stored in it.
3. It should be of such shape that can be elegant and also the contents can be easily drawn from it.
4. It should not leach alkali in the contents.
5. The container should not support mould growth.
6. The container must bear the heat when it is to be sterilized.
7. The contents of container should not be absorbed by the container.
8. The material used for making the container should be neutral or inert.
9. Any part of the container or closure should not react with each other.
10. Closure should be of non toxic nature and chemically stable with container contents.

Functions of Pharmaceutical Packaging

- Containment - The containment of the product is the most fundamental function of packaging for medicinal products. The design of high-quality packaging must take into account both the needs of the product and of the manufacturing and distribution system. This requires the packaging: not to leak, nor allow diffusion and permeation of the product, to be strong enough to hold the contents when subjected to normal handling and not to be altered by the ingredients of the formulation in its final dosage form.
- Protection - The packaging must protect the product against all adverse external influences that may affect its quality or potency, such as light, moisture, oxygen, biological contamination, mechanical damage and counterfeiting/adulteration.
- Presentation and information - Packaging is also an essential source of information on medicinal products. Such information is provided by labels and package inserts for patients.
- Identification - The printed packs or its ancillary printed components serves the functions of providing both identity and information.
- Convenience - The convenience is associated with product use or administration e.g., a unit dose eye drop which both eliminates the need for preservative and reduces risks associated with cross infection, by administering only a single dose.

Categories of Pharmaceutical Packaging Materials

- Primary packaging system is the material that first envelops the product and holds it i.e., those package components and subcomponents that actually come in contact with the product, or those that may have a direct effect on the product shelf life e.g., ampoules and vials, prefilled syringes, IV containers, etc.
- Secondary packaging system is outside the primary packaging and used to group primary packages together e.g., cartons, boxes, shipping containers, injection trays, etc.
- Tertiary packaging system is used for bulk handling and shipping e.g., barrel, container, edge protectors, etc.

Materials used for Pharmaceutical Packaging

Traditionally, the majority of medicines (51%) have been taken orally by tablets or capsules, which are either packed in blister packs (very common in Europe and Asia) or fed into plastic pharmaceutical bottles (especially in the USA). Powders, pastilles and liquids also make up part of the oral medicine intake. However, other methods for taking medicines are now being more widely used. These include parentral or intravenous (29%), inhalation (17%), and transdermal (3%) methods.

These changes have made a big impact on the packaging industry and there is an increasing need to provide tailored, individual packaging solutions, which guarantee the effectiveness of medicines.

The present review article details several key trends that are impacting packaging industry, and offers some predictions for the future packaging encompassing solid oral dosage forms and injectables.

What's next?

Packaging and delivery systems as a differentiator for drug products will continue to become more important, especially in crowded therapeutic areas and for solving industry-wide problems such as drug-product counterfeiting. The market today is receptive to packaging systems that can provide track-and-trace capabilities and product authentication throughout the supply chain. Pharmaceutical seals are an ideal platform for these technologies. The wider use of technologies such as RFID tags embedded in the plastic button affixed to the seal, or ultraviolet inks applied to the seal, providing item-level security may be seen. The drive for cleanliness and purity will no doubt continue into the foreseeable future. With advances in material science, we can expect cleaner elastomeric formulations by utilizing BFS technology for manufacturing primary packaging and delivery-system components e.g., Respules™, Twist Tip™. The coatings with near-total barrier properties e.g., PICVD coatings may have a potential market.

Although predicting the future is problematic, but one prediction with confidence can be made: as pharmaceutical research continues to develop advanced, life-saving therapies, the systems used to package and administer those therapies will keep pace through advances in material science and innovative design.

In the era of globalization, it would be a challenge for the packaging industry, as the years ahead would witness the opening of the global channels, and to match the international standards and quality, it is necessary that packaging industry upgrades more in research to have a holistic approach to packaging that would go beyond functional aspect of packaging. Presently, very few pharmaceutical industries spend time and money on R and D in packaging. The conventional packages available do not serve the purpose of providing protection against counterfeiting and quality, and the industry seems to be sluggish in adopting the technical advances in the packaging, probably on account of the prohibitive cost factor. As packaging industry is directly or indirectly involved in the drug manufacturing process, it becomes ethically mandatory to understand and incorporate scientific methods in packaging. The pharmaceutical packaging trends are on the verge of innovative rapid growth provided the needs of the product, its security, cost and patient convenience is taken into consideration to build brand identity.

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Dementia incidence may have reduced in the western world due to better vascular treatment and enhanced brain health,despite the fact that dementia prevelance is still rising globally. Alzheimer's disease (AD) is the most common form of dementing illness, and the prevalence increases with each decade of life.The aetiology is still unknown,and current pharmacotherapy neither cures nor arrests the pathophysiology. Neuritic plaques and neurofibrillary tangles are the hallmarks of; the definitive cause of the disease is yet to be determined. AD affects multiple areas of cognition and is characterised by a gradual onset with slow,progressive decline. A thorough physical examination,laboratory and imaging studies such as MRI & PET is required to rule out other disorders and diagnose AD before considering drug therapy. Although validity and cost effectiveness have yet to be proven,PET gaining popularity in therapeutic settings. Non drug therapy and social support for the patient and family are the primary treatment interventions. A thorough behavioural assessment and plan with careful examination of environmental factors should be conducted before initiation of drug therapy. Acetylcholinesterase inhibitors and (NMDA) receptor antagonist falls under the category of symptomatic treatments,amyloid binders,and tau therapeutics fall under aetiology-based medicines. Strategies for prevention of the AD through nonpharmacological therapies include lifestyle interventions including exercise,mental stimulation and socialising. AD is significant health concern, is crucial that everyone is aware of, so that prophylactic measures may be taken to reduce the likelihood of its occurrence.

CO-115 TRANSETHOSOMES AND ITS THERMODERMAL EFFECTS ON SKIN

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In the past few decades, an emerging drug delivery system that came into light is transdermal drug delivery system. It has become the talk of the town in the field of drug delivery of its better and easy accessibility. Though it is one of attractive roots, transport of drug through the skin has remained a challenge. To overcome the challenge, vesicular system has been adopted so as to have skin penetration bio-active agents. Vesicular system like liposome has shown inefficiency to cross the layer of skin. Then transethosomes and nanoethosomes are employed for delivery drug into the deeper layer of skin. Nanoethosomes and transethosomes have the same composition that is water, ethanol and phospholipid. Additionally transethosoms contain edge activators. Due to the presence of ethanol and edge activator,it displays enhanced skin permeation. Vesicular system gives a better patient compliance, being a non-invasive method of drug administration. Systemic lupus erythematosus is an autoimmune disorder (SLE), transethosomes and nano ethosomes are theoretically discovered for the treatment of autoimmune disorders like Rheumatoid arthritis and SLE. Practical use of these kind of drugs has not yet been approved due to lack of knowledge about the cause of the disease in the respective subject.

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CO-116 REVIEW OF DRUG DISCOVERY PROCESS

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Drug discovery is a process which aims at identifying a compound therapeutically useful in curing and treating disease as per regulatory authority's guidelines. This process is a lengthy, risky, time consuming, economic, a lot people, equipments, raw materials, guidelines, involves the identification candidates, synthesis, validation, optimization, screening and assays for therapeutic efficacy. Once a compound has shown its significance in this investigation, it will initiate the process of drug development earlier to clinical trials. New drug development process must continue through several stages in order to make a medicine that is safe, effective, and has approved all regulatory requirements. Preclinical studies using animal to study the potential of a therapeutic drug or strategy are important steps before translation to clinical trails. One overall theme of our articles is that the process is sufficiently long, complex, and expensive so that many biological targets must be considered for every new medicine ultimately approved for clinical use and new research tools maybe needed to investigate each new target from initial discovery to a marketable medicine is a long, challenging task. It take about 12-15 years from discovery to the approved medicine and requires an investment of about US $1 Billion on an average, a million molecules screened but only a single is explored in last stage clinical trials and finally made obtainable for patients. The present investigation provides a information about the processes of new drug discovery and development

CO-117 A REVIEW ON INNOVATIVE APPROACHES FOR BRAIN TARGETED DRUG DELIVERY SYSTEM

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The leading neurological disorder in the world, Alzheimer's disease becomes increasingly common as the population ages. Now, significant medication side effects, immunological defects, and inadequate blood-brain barrier permeability are the primary barriers to Alzheimer's disease treatment. The three modes of administration are transporter-, adsorption-, and receptor-mediated. The leading cause of dementia in the elderly is Alzheimer's disease, which impacts 5% of Americans over 65 and 20% over 80. It is characterized by an excess of senile plaques and neurofibrilary tangles, ventricular hypertrophy, and cortical atrophy characterizes it. The transport

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mechanism might be modified by the physicochemical characteristics of the nanoparticles under different surfactant concentrations, stabilizers, and amyloid-affinity agents. After systemic delivery, the therapeutic potential for multiple nanopharmaceuticals for AD has already been shown in-vivo. We covered in detail the latest developments in the use of polymeric and lipidic nanoparticles as a medication delivery method to treat Alzheimer's disease.

CO-118 A REVIEW ON FORMULATION AND INNOVATIVE APPLICATION OF HYDROGELS

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As a result of their physical and chemical crosslinking, hydrogels are three-dimensional networks made of polymers that can absorb vast volumes of water and still stay insoluble in it. They react to changes in temperature, ionic strength, and pH. Natural polymers like dextran, pectin, and alginate, as well as synthetic polymers like polyvinyl alcohol, polyethylene oxide, and polyhydroxyethylmethacrylate, can be used to manufacture them. most of the drugs are converted into hydrogels. By various approaches including physical irradiation, bulk polymerization, complicated coacervation, etc., are used to create them. Hydrogels have discovered multiple applications in optics, tissue engineering, imaging, wound dressings, localized drug delivery, and drug delivery systems. Hydrogel morphology has been evaluated by FTIR, x-ray diffraction, and atomic force microscopy. Their flexibility, swelling behavior, and invitro drug release have also assessed.

CO-119 A REVIEW ON FORMULATION AND EVALUATION OF EMULGELS

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Emulgels' is a controlled drug delivery system with a release control mechanism—which combines both gel and emulsion and that made them one of the most fascinating topical delivery technologies. Pharmaceutical professionals are currently interested in Emulgel systems due to its significant potential to function as a drug delivery vehicle through the incorporation of a wide range of medicinal chemicals. These are either oil-in-water emulsions or water-in-oil emulsions that have been gelled by adding a gel excipient. Emulsion incorporation into a product. It transforms into a dual control release mechanism for the gel, increasing its stability. The words

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"emulsion" and "gel" are combined to create emulgels. Emulgel is a novel treatment for psoriasis, inflammation, arthritis, fungal infections, acne, and other skin problems. A topical system is created by making an emulsion of medication and placing it into an emulgel. Emulgel is a combination of a co-surfactant and a surfactant that has a low interfacial tension and thermodynamic stability. Some of its many characteristics are excellent thermodynamic stability and increased permeability.

CO-120 A REVIEW ON A CLINICAL PERSPECTIVE OF CYSTIC FIBROSIS

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A genetic condition known as cystic fibrosis causes a multi-organ disease with a progressive respiratory decline that eventually results in early mortality. mutations in the CFTR anion channel-coding cystic fibrosis transmembrane conductance regulator gene cause cystic fibrosis. Established CF medications focus on the modulators' downstream manifestations. These innovative drugs enhance CFTR activity and have been licensed in the last five years to lessen the impact of many CF disease-causing mutations. As of April 2017, this review covers phase II and III clinical trials that describe novel modulator therapy and reviews presently approved CFTR modulators on clinicaltrials.gov. The main obstacles to the successful implementation of CF gene therapy include the airway transduction vectors, large animal CF models, the complexity of CF pathophysiology, and the heterogeneity of CFTR expression in airway epithelium. These factors also emphasize the opportunities and prospects for the future.

CO-121 A REVIEW ON A CLINICAL PERSPECTIVE OF ALZHEIMER'S DISEASE

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Any cognitive impairment that is severe enough to interfere with day-to-day activities is referred to be dementia in general. The majority of dementia cases in individuals 65 years of age and beyond are caused by Alzheimer's disease (AD), which makes up at least two thirds of all dementia cases. This review covers current treatments for AD as well as potential future treatments, including natural chemicals, chaperones, and disease-modifying therapeutics (DMT). The pathologic features of the disease include extracellular plaques containing the peptide β-amyloid and neurofibrillary tangles, which contain the hyperphosphorylated version of the

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microtubular protein tau. The α, β, and γ secretases split the bigger protein known as β-amyloid precursor protein into smaller pieces to form β-Amyloid. The γ secretases cleave to Aβ42, an amyloid protein with a 42-amino acid sequence, which produces insoluble fibrils that build up in senile plaques found in AD patients' autopsies. Although lifestyle choices have no direct impact on the pathophysiology of Alzheimer's disease, they can still help those who have the condition live well. Pharmacological therapies with anti-inflammatory, anti-tau, and anti-amyloid β properties are in advanced phases of clinical studies and show promise.

CO-122 INVITRO DENTAL GEL PRODUCTS AND THEIR ACTIVITY

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Dental products are those substances which prevent the dental caries, dental decay and give the freshness and cleanness to the mouth and teeth. In market it is mainly available in the form of toothpaste, tooth powder, mouthwash, tooth gel, dentifrice etc. In dental products many abrasive is used for abrading, granding or polishing. Abrasive are most often found as crystals, small and small particles that are preferred to avoid tooth wear. Hydrated silica is a common abrasive in dentifrice, alumina and calcium carbonate may also be used. The main objective of this review is to aid dental professionals in the selection of the appropriate type of dental products based on the invitro pathological condition being treated, as well as the relevant factors to consider involving such decisions.

CO-123 UNDERSTANDING ORPHAN DRUGS: UNVEILING THERAPEUTIC INNOVATIONS FOR RARE DISEASES

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Orphan drugs are pharmaceuticals developed to treat rare diseases, often affecting a small number of individuals. Due to the limited market potential, these drugs may face challenges in traditional drug development. However, governments and regulatory bodies provide incentives to encourage their development, aiming to address unmet medical needs for rare conditions. These incentives encompass extended market exclusivity, tax credits, and reduced regulatory fees, creating a more conducive environment for pharmaceutical companies to invest in these specialized therapies. Researchers often focus on innovative approaches, including gene therapies and targeted treatments, to address the unique characteristics of rare diseases. Additionally, patient advocacy groups play a crucial role in raising awareness, supporting research efforts, and influencing policy decisions related to orphan drugs. Despite the hurdles, orphan drugs have proven indispensable in providing treatments for rare diseases that would otherwise lack attention. As advancements in

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methanol is used as control. The compound 5a, and 5c have significant activity against b.subtilis at conc. 10 and 30 µg/ml.The anti-fungal activity is determined by using potato dextrose agar medium by cup plate method, anti-fungal activity of chalcone derivatives were compared with the standard griseofulvin at concentration of 100µg/ml against fungi pencillinium chrysogenum taking methanol as control. The compound 5c has significant activity against pencillium chrysogenum at conc. of 200µg/ml. Anti-oxidant activity is determined by stable free radical method, ascorbic acid is used as the standard, DPPH is used as a control. All the synthesized compounds showed potent antioxidant activity.

CO-126 MICROBIOME THERAPEUTICS: UNRAVELING THE HUMAN MICROBIOME'S IMPACT ON DRUG DEVELOPMENT

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The term "human microbiota" pertains to the 10-100 trillion symbiotic microbial organisms-primarily gut bacteria—that are present in every human being. The phrase "human microbiome" refers to the genes that these cells contain. Studies on the human gut microbiome have improved our knowledge of microbial colonization, maturation, and dysbiosis in disease and health-related subgroups.

It is recognized that traditional medicines have led to pathogens developing resistance to antibiotics, non-responsiveness to drugs and poor specificity which can be resolved by microbial therapy. There are growing opportunities to employ gut microorganisms as therapeutic agents to treat human diseases due to their enormous metabolic potential and significance in maintaining human health. By utilizing native or synthetic bacteria, antibiotics, bacteriophages, and bacteriocins, microbiome treatments seek to modify the gut microbiome through additive, subtractive, or modulatory therapy. This strategy could provide personalized, standardized, reliable, and long-lasting treatments. Microbiome-based treatments hold promise for treating a broad range of ailments like cancer, diabetes mellitus, autoimmune disorders like Crohn's disease, ulcerative colitis, inflammatory bowel disease (IBD) and many more. Microbiome treatments, despite their potential therapeutic and financial benefits, are still in their early stages of research and face numerous administrative and technological challenges that require further exploration.

CO-127 GENOMIC TECHNOLOGY IN MEDICINE

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Numerous industries, including bioenergy production, synthetic biology, environmental science, computational science, information technology, medicine, and health and wellness management have all benefited greatly from the development of genomic technologies. The traditional laboratory genetic techniques of microscopic cytogenetics, fluorescence in situ hybridization (FISH), Southern blotting, denaturing gel electrophoresis, single stranded conformation, and many other non-sequencing genetic laboratory methods have rapidly given way to next generation genome sequencing technologies. While Sanger sequencing has continued to play a significant role in genome sequencing, it is no longer the only method used. Several other methods, such as whole exome sequencing, array comparative genome hybridization, and whole genome sequencing, are now well established. Genomic medicine was revolutionised by the sequencing of the entire human genome. Nevertheless, little is known about the intricate interactions between genes, environments, and lifestyles, as well as the impact of non-coding genomic areas on human health. The field of genomic medicine has significant promise for the diagnosis, prognosis, and tailored therapy of diseases. However, a lot of the promising technologies in genomic medicine are still in their early stages of development, and our poor understanding may limit their use, preventing it from being used in many clinical contexts. Clinicians across all specialties can employ genomic technologies to diagnose individuals with high-risk genetic defects causing illness. Genetic data can be used to forecast a person's response to a given medication, including whether or not they will respond well to it and whether or not using it would cause any negative effects.

CO-128 VALIDATION AND METHOD DEVELOPMENT OF ANALYTICAL METHODS AS PER ICH GUIDELINES

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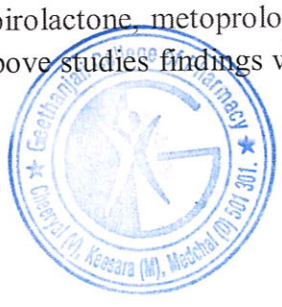
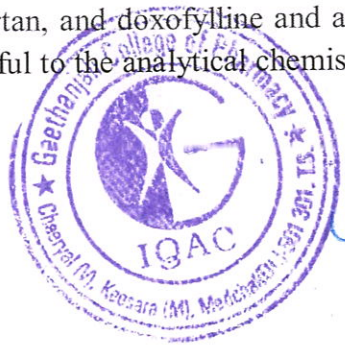
Methods need to be validated or revalidated. newlineThe International Conference of Harmonization (ICH) of technical requirements for the registration of pharmaceutical for human use has developed and provided a consensus text on validation of analytical procedures. The proposed analytical methods are simple, accurate and reproducible. The advantages lie in the simplicity of sample preparation and the cost economic reagents used. The contribution is the limit of detection for all the methods. Results from statistical analysis of the experimental results for all the methods were indicative of satisfactory precision and reproducibility. The advantages lie in the simplicity of sample preparation and the cost economic reagents used. Consequently, it was demonstrated that the suggested techniques could be effectively used to estimate the commercial pharmaceutical formulations including aspirin and rosuvastatin, metolazone and spirolactone, metoprolol and olmesartan, and doxofylline and ambroxol hydrochloride. Thus the above studies findings would be helpful to the analytical chemists to apply the analytical methods





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learning sessions and highly appreciated this method of teaching pharmacotherapy of musculoskeletal system diseases. In our study, more than 93.22% of the students opined that they enjoyed sessions and it held their interest and motivated them to learn better. The 't-test between post-test 1 and post-test 2 scores was statistically significant with a P value of 0.0001. This suggests that CBL is effective in students' learning, and reinforces important concepts, strengthening information retention and long-term memory. In conclusion, the perception of pharmacy practice students towards case-based learning is highly contented and encountered a very positive impact on understanding and retention of knowledge in musculoskeletal system diseases and drug therapies.

CO-137 THE INNOVATIVE APPROACH TO TREATING ULCERATIVE COITUS THROUGH CHRONOPHARMACEUTICS

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The current advances in chronobiology and the knowledge gained from chronotherapy of elected disorders explosively suggest that "the one size fits each at all times" approach to medicament delivery is no longer substantiated, at least for opted bioactive agents and disease curative. Ulcerative colitis (UC) is a long-term relapsing and blinking gastrointestinal illness of uncertain etiology. The pathogenicity of ulcerative colitis is believed to be an aberrant susceptible response in which antibodies are formed against colonic epithelial protein(s). The last two decades have seen an expansion in the remedial magazine used to treat UC. This has resulted in bettered clinical remission and response rates. Nonetheless, millions in our current medical operations appear from trials conducted in the early 20th century. This is the first large-scale gene expression study of inflamed mucosa from cases with UC treated withanti IL23p19 remedy. These results deliver molecular evidence for mucosal recovery from a broad check of changes in transcriptions that enrich our understanding of the molecular effects of IL- 23p19 inhibition in UC. In this review, we aim to outline the vital milestones in the history of the medical operation of UC in addition to promising remedial developments for the future.

CO-138 CLEARUP SINUS PAIN RELIEF- MEDICAL DEVICE

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Clear Up Sinus Relief devices is a transcutaneous electrical nerve stimulator that electrically stimulates the skin overlying the paranasal sinuses and is intented to be used for temporary relief of moderate to severe congestion. ClearUp Sinus Relief is a treatment to be used at home by individuals 18 and older.ClearUp is clinically proven, drug free, non invasive, and proveds rapid relief. ClearUp is classified as a US FDA class II and EU class IIa medical devices. Sinusitis is present when the tissue lining the sinuses become swollen or inflamed. It occurs as the result of an inflammatory reaction or an infection from a virus, bacteria, or fungus. Medical devices is an apparatus, appliance, software material, or other article whether used alone or in combination, including the software intented by its manufacturer to be used specifically for diagnostic or therapeutic purposes and necessary for its proper application.

CO-139 A REVIEW ON FORMULATION AND INNOVATIVE APPLICATION OF HYDROGELS

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As a result of their physical and chemical crosslinking, hydrogels are three-dimensional networks made of polymers that can absorb vast volumes of water and still stay insoluble in it. They react to changes in temperature, ionic strength, and pH. Natural polymers like dextran, pectin, and alginate, as well as synthetic polymers like polyvinyl alcohol, polyethylene oxide, and polyhydroxyethylmethacrylate, can be used to manufacture them. most of the drugs are converted into hydrogels. By various approaches including physical irradiation, bulk polymerization, complicated coacervation, etc., are used to create them. Hydrogels have discovered multiple applications in optics, tissue engineering, imaging, wound dressings, localized drug delivery, and drug delivery systems. Hydrogel morphology has been evaluated by FTIR, x-ray diffraction, and atomic force microscopy. Their flexibility, swelling behavior, and invitro drug release have also assessed.

CO-140 A REVIEW ON A CLINICAL PERSPECTIVE OF ALZHEIMER'S DISEASE

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Any cognitive impairment that is severe enough to interfere with day-to-day activities is referred to be dementia in general. The majority of dementia cases in individuals 65 years of age and beyond are caused by Alzheimer's disease (AD), which makes up at least two thirds of all dementia cases. This review covers current treatments for AD as well as potential future treatments, including natural chemicals, chaperones, and disease-modifying therapeutics (DMT). The pathologic features of the disease include extracellular plaques containing the peptide β-amyloid and neurofibrillary tangles, which contain the hyperphosphorylated version of the microtubular protein tau. The α, β, and γ secretases split the bigger protein known as β-amyloid precursor protein into smaller pieces to form β-Amyloid. The γ secretases cleave to Aβ42, an amyloid protein with a 42-amino acid sequence, which produces insoluble fibrils that build up in senile plaques found in AD patients' autopsies. Although lifestyle choices have no direct impact on the pathophysiology of Alzheimer's disease, they can still help those who have the condition live well. Pharmacological therapies with anti-inflammatory, anti-tau, and anti-amyloid β properties are in advanced phases of clinical studies and show promise.

CO-141 A NOVEL DRUG DELIVERY SYSTEM: HYODEOXYCHOLIC ACID-MODIFIED METFORMIN LIPOSOMES FOR TYPE 2 DIABETES TREATMENT

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Metformin is commonly prescribed as a primary medication for treating type 2 diabetes, but its use is often associated with gastrointestinal issues, low bioavailability, and a short half-life. Liposomes serve as an effective drug delivery system, offering a means to mitigate side effects and enhance bioavailability. Hyodeoxycholic acid, a compound with a structure similar to cholesterol, has demonstrated the ability to regulate glucose levels. Incorporating hyodeoxycholic acid into liposomes can address the limitations of metformin while bolstering its hypoglycemic effects. In this study, three variations of liposomes were created using different ratios of hyodeoxycholic acid and metformin (HDCA:ME-(0.5:1)-Lips, HDCA:ME-(1:1)- Lips, and HDCA:ME-(2:1)-Lips) through the thin-film dispersion method. Characterization of these liposomes revealed distinct properties, with excessive hyodeoxycholic acid leading to reduced encapsulation efficiency and drug loading. In vivo experiments conducted on type 2 diabetic mice demonstrated that all three types of liposomes effectively lowered fasting blood glucose levels, improved glucose tolerance, regulated oxidative stress markers, and protected liver tissues. Notably, HDCA:ME-(1:1)-Lips emerged as the most effective among the liposome variations, surpassing the effects of metformin alone. The findings suggest that hyodeoxycholic acid

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enhances the hypoglycemic impact of metformin, serving a beneficial role as an excipient in liposome formulations.

CO-142 STONEMAN SYNDROME- A DISORDER CAUSING SECOND SKELETON IN THE BODY

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Fibrodysplasia ossificans progressiva is an ultrarare autosomal dominant disorder and disabling syndrome characterized by postnatal progressive heterotopic ossification of the connective tissue and congenital malformation of the big toes. Fibrodysplasia ossificans progressiva has worldwide prevalence of about 1 in 2 million births. Nearly 90% of patients with fibrodysplasia ossificans progressiva are misdiagnosed and mismanaged and thus undergo unnecessarily interventions. So far, the number of reported existing cases worldwide is about 700. Clinical examination, radiological evaluation, and genetic analysis for mutation of the ACVR1 gene are considered confirmatory tools for early diagnosis of the disease. Association of fibrodysplasia ossificans progressiva with heterotopic ossification is well documented; however, postsurgical exaggerated response has never been reported previously, to the best of our knowledge.
Fibrodysplasia ossificans progressiva is a very rare and disabling disorder that, if misdiagnosed, can lead to unnecessary surgical intervention and disastrous results of early disability. We need to spread knowledge to physicians and patients' family members about the disease, as well as its features for early diagnosis and how to prevent flare-up of the disease to promote better quality of life in these patients.

CO-143 NANOPARTICLE POLYMERS INFLUENCE ON CARDIAC HEALTH: GOOD OR BAD FOR CARDIAC PHYSIOLOGY?

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Cardiovascular diseases (CVD) are one of the leading causes of death and morbidity worldwide. Lifestyle modifications, medications, and addressing epidemiological factors have long been at the forefront of targeting therapeutics for CVD. Treatments can be further complicated given the intersection of gender, age, unique comorbidities, and healthcare access, among many other

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factors. Therefore, expanding treatment and diagnostic modalities for CVD is absolutely necessary. Nanoparticles and nanomaterials are increasingly being used as therapeutic and diagnostic modalities in various disciplines of biomedicine. Nanoparticles have multiple ways of interacting with the cardiovascular system. Some of them alter cardiac physiology by impacting ion channels, whereas others influence ions directly or indirectly, improving cellular death via decreasing oxidative stress. While embedding nanoparticles into therapeutics can help enhance healthy cardiovascular function in other scenarios, they can also impair physiology by increasing reactive oxidative species and leading to cardiotoxicity. This review explores different types of nanoparticles, their effects, and the applicable dosages to create a better foundation for understanding the current research findings.

CO-144 RP-HPLC METHOD DEVELOPMENT AND VALIDATION OF RELUGOLIX

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Zobrax stationary conditions are used in chromatography (160mm x5.5 mm, 5m). , portable stage ACN:Ammonium was used in a 55:45 ratio, with a detection wavelength of 310 nm, a column temperature of 30^{O}C, and mobile phase as the diluent. A 2.79-minute retention time was discovered. Between 25% and 150% levels, a linearity research was conducted, and an R2 value was discovered.0.999 is to be. The results showed that the method precision was 0.5 and the intermediate precision was 0.2. The corresponding LOD and LOQ values are 0.4 g/ml and 1.2 g/ml.

CO-145 CARDIOPROTECTIVE ACTIVITY AND ANTIOXIDANT ACTIVITY OF CURCUMIN AGAINST DRUG INDUCED TOXICITY

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In this study, we investigated the cardiotoxic effects of Levophed or Norepinephrine, an anti-hypotensive drug, and explored the potential of natural cardio-protective compounds as an alternative approach to reduce NE-induced toxicity. The study focused on NE-induced concentration and time-dependent cellular responses in H9C2 cardio myoblasts to identify critical

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promyelocytic leukemia (APL)/blood cancer is M3 type of acute myeloid leukemia (AML) formed inside bone marrow through chromosomal translocation mutation usually between chromosome 15 & 17. It accounts around 10% cases of AML worldwide. Trisenox (TX/ATO) is used in chemotherapy for treatment of all age group of APL patients with highest efficacy and survival rate for longer period. High concentration of TX inhibits growth of APL cells by diverse mechanism however, it cures only PML-RARα fusion gene/oncogene containing APL patients. TX resistant APL patients (different oncogenic make up) have been reported from worldwide. This review summarizes updated mechanism of TX action via PML nuclear bodies formation, proteasomal degradation, autophagy, p53 activation, telomerase activity, heteromerization of pRb & E2F, and regulation of signaling mechanism in APL cells. This update contributes valuable information for further understanding the therapeutic potential of trisenox in the context of blood cancer treatment.

CO-179 MEDICINAL PLANTS AND BIOACTIVE COMPOUNDS USED IN TREATMENT OF POLYCYSTIC OVARY SYNDROME(PCOS)

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Polycystic ovarian syndrome (PCOS) is distinguished by uneven menstrual cycle and it is aneuroendocrine metabolic disorder. Therapy for this disorder is done utilizing manmade drugs that are efficacious. Patients inspired by natural remedies used for effective therapeutic results with natural drugs in treating PCOS and the restraint of allopathic medicines. The perspective in important natural remedies, it's considered that the role of various plants and bioactive compounds in PCOS. We have discussed importance of natural medication in curing PCOS their chemical mixture and mechanism of action in herbal drugs and bioactive compound in this review article. Researchers working and understanding the role of natural medicine in PCOS can get a help from this article which can be resource of good information.

CO-180 HERBAL FACE CREAM OVERVIEW

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This is an in-depth examination of face creams, exploring their purposes, components, and many revenue streams. Herbal face creams are essential to skincare routines since they provide several advantages for the skin of the face. They are designed to replace moisture, moisturize, and nourish

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the skin, preventing dryness. Additionally, they serve as a barrier of defense, defending the skin from environmental aggressors like pollution and UV rays. They also help to improve the texture, tone, and elasticity of the skin, giving the appearance of more youthful and radiant skin. The components of face creams vary according to their particular properties. Hyaluronic acid and glycerin are examples of humectants found in moisturizing face creams; these substances draw and hold moisture to the fine lines, wrinkles, and age spots on the skin. Sunscreen-infused face lotion lowers the chance of developing skin cancer and protects against damaging UV radiation. When selecting a face cream, those with acne-prone skin types should look for formulas that are lightweight and oil-free. It is important to take into account variables like sensitivity, allergies, and certain skin conditions while selecting a face cream. To verify compatibility and efficacy, it is advised to do the patch test and speak with dermatologists.

CO-181 PREPARATION AND EVALUATION OF MULTIPURPOSE CREAM

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Herbal formulations are preparations that consumers apply to improve their looks. These goods are made from plant components, and the demand for herbal items has skyrocketed in the twenty-first century as consumers become more aware of the uses and consequences of cosmetics. Creams are the most used herbal formulations. These are applied on the skin with friction. Creams are prepared from the herbal extracts of Aloe barbadensis miller, Ocimum tenuiflorum, Curcuma longa, and others. A variety of pharmaceutical properties, including viscosity, spreadability, rheology, pH, electrical conductivity, and stability, were assessed for the cream. They also act as a barrier of defense, protecting the skin from UV radiation and other environmental aggressors. The current study found that herbal creams are a valuable treatment for typical dermatological issues that result in acne, inflammation, localized infections, and anti-aging products.

CO-182 DESIGN AND DEVELOPMENT OF KETOCONAZOLE NANOSPONGES LOADED GELS FOR TOPICAL DRUG DELIVERY

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diffusion studies to select the suitable vehicles for improving the bioavailability. Solubility studies were conducted in presence various primary and secondary surfactants. Ternary diagrams were constructed to optimise the oil: mix ratio. The optimised formulation was filled into capsule shell and subjected to various quality control tests. The blend containing badam oil: smix ratio 1:9 and smix: composed with tween 80: propylene glycol ratio 1:1Was found to be more suitable to improve the oral bioavailability of Atenolol.

CO-187 IMPACT OF STRESS, ANXIETY, AND DEPRESSION ON CHRONIC KIDNEY DISEASE AND ITS EFFECTS ON QUALITY OF LIFE

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Kidney disease is considered one of the major global public health problems affecting more than 750 million people worldwide, CKD is expected to become the 5th common cause of year of life lost. The primary objective of this study conducted at KIMS-Saveera in Anantapur, was to assess the levels of stress, anxiety, and depression among individuals diagnosed with chronic kidney disease. Focusing on 400 CKD-diagnosed participants, the research employed an online survey through Google Forms includes questions about health, the DASS-21 scale to understand mental well-being, and the KDQOL scale to evaluate the quality of life related to kidney disease. The study concluded participants had moderate levels of depression (41.3), anxiety (37.5), and stress (31.7) were found to be respectively. Notably, a significant negative correlation was observed between age and psychological health (PHC) ($r=-0.198, n=400, p=0.004$), indicating that as age increases, psychological health tends to decline in CKD patients. The findings underscore the importance of considering mental health factors in the overall care of individuals and emphasizing a holistic approach to address both physical and emotional well-being.

CO-188 COMPREHENSIVE APPROACHES OF DENDRIMERS AS MULTIFUNCTIONAL NANO-CARRIERS TO COMBAT BREAST CANCER

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In this abstract, I would like to discuss about the development of advanced technique of dendrimers using nano-carriers to fight against breast cancer. Breast Cancer (BC) is a highly heterogeneous malignant carcinoma that is the most frequently occurring cancer in women. The major types of BC are luminal A, basal-like, luminal B, Human Epidermal Growth Factor Receptor 2 (HER2) positive/ Estrogen Receptor (ER) negative, and Triple-Negative BC (TNBC). The conventional therapies against BC include various chemotherapeutic agents in different combinations. Along with the chemotherapeutic drugs, alternatives like hormonal therapy, radiation, and nanotechnology are emerging fields in treating breast carcinoma. Dendrimers are three-dimensional hyper-branched nanosized structures that deal with the toxicity and resistance of chemotherapeutic agents in BC. These nanocarriers can carry drugs on the surface as well as inside the cavity to the desired site. Dendrimers have high loading capacity and exhibit targeted delivery of drugs resulting in reduced side effects. The current review discusses the utilization of dendrimers for treating BC and conquering the limitations of multidrug resistance.

CO-189 THE ROLE OF PHARMACIST IN MEDICATION SAFETY

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Pharmacists play a crucial role in ensuring medication safety. They assist other healthcare professionals to prevent medication errors and adverse drug reactions. One of the main responsibilities of pharmacists is to verify and review prescriptions to ensure that the correct medication, dosage, and instructions are provided. They are trained to identify potential drug interactions, allergies, and contraindications that may pose a risk to patients. Pharmacists also play a significant role in medication reconciliation, which involves comparing a patient's current prescription to the prescribed medication information. Furthermore, pharmacists instruct patients about how to use medications properly, including how much to take, possible adverse effects, and how to store them. Patients can receive resources to help them remember to take their prescribed prescriptions on time, as well as counseling on medication adherence. When patients have queries or concerns about their prescriptions, pharmacists are available to assist them. Pharmacists work with healthcare organizations to ensure pharmaceutical safety in addition to their direct patient care obligations. In the process of reporting and analyzing pharmaceutical errors, they assist in identifying flaws in the system and putting preventative measures in place. Pharmacists ensure that best practices in medication management are followed by contributing to medication safety guidelines and regulations. Ultimately, by guaranteeing precise dispensing, educating patients, and actively taking part in pharmaceutical safety activities.

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CO-190 A REVIEW ON INNOVATIVE APPROACHES FOR BRAIN TARGETED DRUG DELIVERY SYSTEM

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The leading neurological disorder in the world, Alzheimer's disease becomes increasingly common as the population ages. At the moment, significant medication side effects, immunological defects, and inadequate blood-brain barrier permeability are the primary barriers to Alzheimer's disease treatment. The three modes of administration are transporter-, adsorption-, and receptor-mediated. The leading cause of dementia in the elderly is Alzheimer's disease, which impacts 5% of Americans over 65 and 20% over 80. It is characterized by an excess of senile plaques and neurofibrilary tangles, ventricular hypertrophy, and cortical atrophy characterizes it. .. The transport mechanism might be modified by the physicochemical characteristics of the nanoparticles under different surfactant concentrations, stabilizers, and amyloid-affinity agents. After systemic delivery, the therapeutic potential for multiple nanopharmaceuticals for AD has already been shown in vivo. We covered in detail the latest developments in the use of polymeric and lipidic nanoparticles as a medication delivery method to treat Alzheimer's disease.

CO-191 RECENTLY BANNED DRUGS IN INDIA

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Taking medicine is a part of life for many people. However, some medicines can be harmful or even deadly, which is why the government bans them. In India, the Central Drugs Standard Control Organization (CDSCO) is responsible for ensuring the safety and efficacy of medicines. It also maintains a list of banned medicines that are no longer allowed to be manufactured, sold, or used in the country.

To safeguard public health and ensure the safety and efficacy of medications, the Indian government periodically bans certain drugs. This article provides a comprehensive guide to the list of banned medicines in India as of 2023, with a focus on clarity and accessibility for the public.List of Banned Single Drugs:

Amidopyrine
Phenacetin
Nialamide
Chloramphenicol (Except for ophthalmic and topical preparations)

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CP-101 FORMULATION DEVELOPMENT AND EVALUATION OF ORAL FILMCONTAINING ANTI DEPRESSANTS

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Fluvoxamine, an antidepressant belonging to serotonin reuptake inhibitor (SRI) class, exhibits maximum absorption through the oral route of administration. The objective of current research is to formulate mouth dissolving fluvoxamine films by employing super disintegrants. Fluvoxamine mouth dissolving films formulated by employing solvent-casting method using HPMC E15, eudragit RL100, and PEG 4000. FF15 with a maximum tensile strength of 55.63 ± 1.37 mg, least disintegration time of 10 ± 1.85 seconds, and highest drug release of 98.29 ± 1.87 % is chosen as an optimal formulation with maximum content uniformity and folding endurance. From in vivo bioavailability studies, Cmax and Tmax of the fluvoxamine optimized mouth dissolving film formulation were significant ($p<0.05$) compared to fluvoxamine marketed formulation. AUC0-∞ infinity for the optimized formulation was higher (733.84 ± 2.04 ng.h/mL) than the fluvoxamine marketed product formulation (485.67 ± 1.54 ng.h/mL). Statistically, AUC0-t of the optimized mouth dissolving film formulation was significantly higher ($p<0.05$) than fluvoxamine marketed product formulation. In vivo pharmacokinetic studies in rabbits confirmed the quick release and increase in bioavailability for fluvoxamine from optimized mouth dissolving film formulation as compared to the fluvoxamine marketed product formulation.

CP-102 THE INNOVATIVE APPROACH TO TREATING ULCERATIVE COITUS THROUGH CHRONOPHARMACEUTICS

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The current advances in chronobiology and the knowledge gained from chronotherapy of elected disorders explosively suggest that "the one size fits each at all times" approach to medicament delivery is no longer substantiated, at least for opted bioactive agents and disease curative. Ulcerative colitis (UC) is a long-term relapsing and blinking gastrointestinal illness of uncertain etiology. The pathogenicity of ulcerative colitis is believed to be an aberrant susceptible response in which antibodies are formed against colonic epithelial protein(s). The last two decades have seen an expansion in the remedial magazine used to treat UC. This has resulted in bettered clinical remission and response rates. Nonetheless, millions in our current medical operations appear from trials conducted in the early 20th century. This is the first large-scale gene expression study of inflamed mucosa from cases with UC treated withanti-IL23p19 remedy. These results deliver molecular evidence for mucosal recovery from a broad check of changes in transcriptions that enrich our understanding of the molecular effects of IL- 23p19 inhibition in UC. In this review, we aim to outline the vital milestones in the history of the medical operation of UC in addition to promising remedial developments for the future.

CP-103 FORMULATION DEVELOPMENT AND EVALUATION OF FAST DISSOLVING TABLETS

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CP-107 ADVANCED FORMULATION TECHNIQUES TO ENHANCE SOLUBILITY, DISSOLUTION AND BIOAVAILABILITY OF POORLY WATER-SOLUBLE DRUGS

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Bioavailability is the rate and extent (amount) of absorption of an unchanged drug from its dosage form. This is considered as a primary parameter for a drug to show maximum pharmacological response. The poor aqueous-soluble drug can exhibit poor dissolution rates and incomplete absorption resulting in poor bioavailability. The dissolution and solubility parameters of the drug are very important in developing formulation. So, different methods are employed to improve the drugs solubility such as pH adjustment, micronization, solid dispersion, Supercritical fluid recrystallization, complexation, use of surfactants, co- solvency, Precipitation, and nanotechnology etc. The main objective of this study is to give an overview of methods to enhance solubility, dissolution, and bioavailability of low aqueous soluble drugs and the importance of green chemistry in nanotechnology to produce various nanosized formulations.

CP-108 PHARMACOMETRICS: PHARMACOTHERAPY AND DRUG DEVELOPMENT

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Pharmacometrics is a new field of study that uses mathematical models to connect biology, physiology, and pharmacology with patient characteristics and disease states to quantify the relationship between medications and patients. To generate an individualised medication schedule, information and data collected from multiple sources are quantitatively connected. Pharmacometrics plays a crucial role in clinical decision making and can be used to prevent adverse drug reactions and interactions through pharmacokinetic modelling, as well as to optimize dosage for individual patients. The accomplishment of five "rights" is necessary for a positive clinical outcome. These rights include giving the appropriate medication to the appropriate patient at the appropriate time in the appropriate dose via the appropriate route of administration. The chemist's clinical decision-making objectives include these five rights. The selection of the appropriate dose is the most crucial factor for a successful therapeutic outcome, following the choice of the appropriate medication for a given condition. Dose individualization is crucial for safe and effective drug therapy because underdosing can lead to both therapeutic failure and, in the case of antibiotics, the emergence of pathogenic microorganism resistance, and excessive drug dosage can be toxic. The pharmacokinetics (PK) of a drug can be affected by the demographics, pathophysiological conditions, and concurrent drug administration of the patients. This can impact the drug's availability at the target site in the body as well as its amount and rate of release. To optimise the dose of a drug, variations can be considered in a quantifiable way using stepwise covariate modelling (SCM) and integrated into population pharmacokinetic (popPK) models. Thus, advances in computational power, mathematical modelling, and the ease of accessing large preclinical and clinical data sets resulted in the establishment of the quantitative systems pharmacology (QSP) field. In order to predict systemic effects, this relatively new field combines PK/PD with biophysically detailed mechanistic models of physiology. Applications for QSP are numerous and include developing and examining novel mechanistic theories of perceived

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effects, identifying ideal or substitute targets, achieving confidence in the logic of existing and/or emerging targets, and in-silico modelling using computer software tools to satisfy the therapeutic and regulatory needs for new drug development and clinical judgement. Clinical pharmacometricians employ models for active therapeutic drug management in a prospective manner, which plays a crucial role in optimizing therapeutic outcomes for appropriate pharmacotherapy practice. Beyond models to simulate various trial designs and to aggregate a multitude of preclinical and early clinical data through drug exposure disease models in clinical drug development, pharmacometrics is an indispensable tool. Decide regarding the process's next steps. In certain vulnerable populations, such as children, the elderly, and patients with co-occurring diseases or medications in low- and middle-income countries (LMICs), the practice of pharmacometrics can be crucial in optimising the use of medications through precise dosing. However, because of a lack of experts, competency-related intentions, and regulatory authority support, these practices are being disregarded in LMICs. When used by a qualified clinician or researcher, pharmacometric analysis can offer arguably better insight than any other tool currently available to address these questions. For population-based pharmacometrics analysis, nonlinear mixed effect models (NONMEM) have been widely utilised. Moreover, modelling with NONMEM software is regarded as gold standard by the US FDA. Analysing data that is sparse is a distinctive feature of NONMEM provides a significant benefit to patients, such as neonates and other critically ill paediatric and geriatric patients, from whom sample collection is challenging. It is also essential to choose the right dose for these susceptible patient groups. Clinicians can design the right dosage schedule for each patient, guaranteeing the safe and efficient treatment of underlying clinical conditions, by developing PK models and establishing correlations between PK parameters and patient demographics.

CP-109 NANOMEDICINE-BASED APPROACHES FOR IMPROVED DELIVERY OF PHYTO-THERAPEUTICS FOR CANCER THERAPY

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A collection of about 100 illnesses collectively known as cancer have plagued humans since prehistoric times. The prognosis for cancer patients has not changed much, even while traditional therapy approaches have improved. Thus, there is a great need for novel, efficient anticancer medications as well as alternative therapy approaches. Since ancient times, various plant components and their extracts have been utilised to treat a wide range of illnesses and alleviate physical suffering. Herbal items have been utilised worldwide in traditional medicine to cure a variety of illnesses and imbalances. It has been discovered that active ingredients in herbal medication, such curcumin, are beneficial against cancer. The field of medicine is undergoing a transformation because to advances in nanomedicine. In recent decades, significant advancements have been achieved in the production of nanocarriers. When employing these innovative nanocarriers, the therapeutic benefits of traditional medications are said to increase significantly thanks to the application of nanotechnology. Safe components such as lipids, polysaccharides, and synthetic biodegradable polymers were used to create the nanocarriers. Nanomedicines can be created as biologically active products or as drug delivery devices. According to available data, nanotechnology is one of the new and fastest-developing Nano formulations, with the greatest potential for high-tech applications.

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CP-110 PRECISION MEDICINE: A NEW VISION IN THERAPEUTICS

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Precision medicine, also known as personalized medicine, represents a revolutionary approach in healthcare that tailors' medical interventions to the unique characteristics of individual patients. At its core, this methodology relies on a comprehensive analysis of an individual's genetic, molecular, and clinical data to make informed decisions about their healthcare. By understanding the distinct genetic makeup and molecular signatures of patients, healthcare professionals can customize treatments, optimizing their efficacy and minimizing potential side effects. The method involves advanced technologies such as genomic sequencing, which decodes an individual's DNA to identify genetic variations associated with diseases and treatment responses. Precision Medicine endeavours to demarcate diseases using multiple data sources from genomics to digital health metrics to facilitate an individualized yet "Evidence-based" decision regarding diagnostic and therapeutic approaches. In this way therapeutics can be cantered toward patients based on their Molecular presentation rather than grouping them into broad categories with a one-size-fits-all approach.

However, the implementation of precision medicine also presents challenges. It requires sophisticated data analysis, infrastructure for genomic testing, and ethical considerations related to privacy and consent. Despite these challenges, the results of precision medicine hold the promise of transforming healthcare by ushering in an era where treatments are not only effective but also tailored to the unique genetic and molecular characteristics of each individual patient. The aim is to provide a broad overview of the advent and emergence of precision medicine in view of its current implications.

CP-111 ANTI-DIABETIC NANO-FORMULATION FROM HERBAL SOURCE

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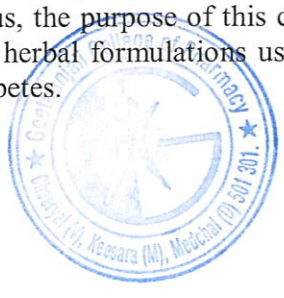
One of the chronic metabolic disorders that affects millions of individuals worldwide is diabetes. In addition to appropriate medicine selection and dosage, traditional medications cause unfavourable side effects in diabetics. Research using substances with natural origins is Becoming more and more popular because of their low cost, simple accessibility, and few adverse effects. Even though most biologically active ingredients are very soluble in water, their absorption capacity is often limited. Most of them have a limited absorption capacity and are unable to penetrate the lipid bilayers of cells because of their huge molecular sizes, which results in a failure to achieve bioavailability and a subsequent loss of efficacy. Solid lipid nanoparticles [SLNs], liposomes, proliposomes, nanospheres, nanocapsules, and nano-emulsion are just a few of the formulations based on nanotechnology that have given such issues new life in recent years. By making plant extracts or active ingredients more soluble, bioavailable, and effective while also lowering dosage requirements and adverse effects, combining herbal medications with nanotechnology may enhance their therapeutic benefits. Thus, the purpose of this chapter's presentation is to provide an overview of the research on the herbal formulations using nanotechnology that have been shown to be effective against diabetes.



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CP-112 GREEN CHEMISTRY IN PHARMACY: A SUSTAINABLE APPROACH FOR PHARMACEUTICAL INNOVATION

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This abstract provides an overview of Green Chemistry and its relevance to the field of pharmacy. Green Chemistry offers a sustainable framework for redefining traditional pharmaceutical processes, aligning them with environmentally conscious practices. In this presentation, we delve into the introductory aspects of how Green Chemistry principles can reshape. The introduction sets the stage by elucidating the critical need for integrating Green Chemistry principles into pharmaceutical practices. As the global demand for pharmaceuticals rises, so does the urgency to address environmental concerns associated with traditional manufacturing processes. This section will delve into the historical context, emphasizing the impact of pharmaceutical production on ecosystems and the imperative to transition toward sustainable methodologies.

CP-113 BLOCKCHAIN TECHNOLOGY

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Blockchain technology is speeding up digital transformation in a number of sectors, including health care. The pharmaceutical sector faces several challenges, including inadequate transparency, challenges in tracing items, low trust, and the supply of outdated goods. Numerous of these issues have been resolved with the use of blockchain technology. Preventing counterfeit drugs was the most often mentioned category, which aligns with the pharmaceutical industry's main goal. Conventional systems usually store data on central servers that are vulnerable to hacking. On the other hand, blockchain disperses data among its users, making it exceedingly difficult for a single party to falsify data. Information is nearly impossible to change or remove once it is stored on a blockchain. Every block has a reference to the one before it, thus changing one block would mean modifying every other block on the network, which is practically impossible. Blockchain improves security against unwanted access by securing data using cryptographic techniques. Protecting sensitive patient data and intellectual property is especially important in the pharmaceutical sector. Blockchain records are chronological and immutable, which makes it feasible to track a product or piece of information through its whole lifecycle. This entails monitoring the source of raw materials, production methods, distribution, and even patient usage in the pharmaceutical industry. Preserving data integrity is crucial in a time when digitalization is the norm. Blockchain records that are transparent and impervious to tampering reduce the possibility of data manipulation, promoting regulatory submissions, clinical trials, and research. Pharma supply chains are global in scope and involve numerous middlemen, making it extremely difficult to track and validate each stage.

CP-114 PHARMACOGENOMICS AND PERSONALIZED MEDICINE

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The study of how a person's genetic makeup influences their reaction to medications is known as pharmacogenomics. To create safe, effective pharmaceuticals, this science merges genomics and pharmacology. Pharmacological response variations resulting from genetic variations are addressed, and by customising medication based on a patient's genotype, they have the potential to transform drug therapy. In particular, the Dutch Pharmacogenetics Working Group (DPWG) and the Clinical Pharmacogenetics Implementation Consortium (CPIC) have created established recommendations for a number of drug-gene interactions, which are publicly accessible as an online resource. However, new tools and insights into the clinical use of pharmacogenomics will be made possible by ongoing globally coordinated initiatives designed to remove the current obstacles to pharmacogenomic adoption. Scientists discover genetic loci linked to known drug responses and then test individuals whose reaction is unknown to determine if these gene variations impact an individual's drug response in the same manner as they determine gene variants linked to disorders. When investigating pharmacological action in humans, scientists primarily look at two factors: (1) the amount of a drug required to reach the intended location in the body, and (2) the degree to which the intended target cells—such as neurones or heart tissue—respond to the medication.

CP-115 3D PRINTING TECHNOLOGY

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Three-dimensional printing (3DP) is a rapid-prototyping technology that uses a digital model file to construct an object through layer printing. There are several uses for this cutting-edge technology in the fields of industrial, medical, aerospace, and architecture. Though the pharmaceutical business is anticipated to undergo a 3DP revolution, the applications of 3DP technology in this field are still in their infancy. This survey of current developments in the field of 3D-printed pharmaceutical tablets serves as a resource for upcoming research projects and uses of 3DP technology in the pharmaceutics industry.

CP-116 DEVELOPMENT OF POTENTIAL INHBITORS FOR MPRO TARGET OF SARS- COV-2: COMPUTATIONAL APPROACH

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Phytoconstituents from various herbal plants were docked with Mpro target of SARS Cov-2 and the affinity towards the receptor was calculated as binding energy (kcal/mol). Among them, four constituents showed highest binding affinity as standard N3 inhibitor. MD studies showed that all four compounds possess comparatively stable ligand-protein complexes with Mpro target compared to the N3-Mpro complex. Based on the above results, the phytochemical constituent, scaftoside (-8.7 kcal/mol) showed similar binding affinity as standard towards the target protein Mpro. ADMET studies for the top 8 highest binding energy phytochemicals showed a better safety profile. Hence, these phytochemicals can be further studied and used as a parent core molecule to develop innovative lead molecules for breast cancer therapy.

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CP-117 OVERVIEW ON SPINOCEREBELLAR ATAXIA

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Spinocerebellar ataxia (SCA) is a group of inherited brain disorders. It affects your cerebellum, a part of your brain vital to coordination of physical movement, and sometimes your spinal cord. Experts have discovered more than 40 types of SCAs so far, and that number may increase. All types of SCAs have similar causes and symptoms. All SCAs display classic cerebellar signs and many display disabling noncerebellar features, most commonly brainstem dysfunction. Eye movement abnormalities are common, reflecting cerebellar and brainstem degeneration. Visual loss from retinal degeneration is rare in SCA, occurring most commonly and profoundly in SCA7. The numbers indicate the order in which experts discovered the associated mutations. In other words, SCA1 was the first type linked to an inherited chromosomal problem. SCA2 was the second, etc. The condition is usually inherited in an autosomal dominant fashion. This means that it takes only one copy of the mutated gene from one biological parent to cause the condition. Therefore, when a person with SCA has children, each child has a 50% chance of inheriting the mutated gene. Signs and symptoms of SCA usually appear after age 18 and slowly worsen over several years. Genetic testing can confirm many types of SCA. However, some types aren't associated with a specific mutation, so experts can't confirm all types of SCAs this way. here's no known cure for SCA. Treatment aims to reduce symptoms and improve functioning. There aren't any proven strategies to prevent SCA. Some families who know they carry the mutation may choose not to have children. That is the only way to prevent passing down the condition to the next generation.

CP-118 DEVELOPMENT AND VALIDATION OF SPECTROPHOTOMETRIC METHOD FOR THE ESTIMATION OF PREGABALIN AND EPALRESTAT IN PHARMACEUTICAL FORMULATIONS

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A simple, accurate and sensitive UV spectrophotometric method was developed and validated for the determination of Pregabalin and Epalrestat in pharmaceutical formulation for the first time. The absorbance was measured at 575nm for Epalrestat and 390nm for Pregabalin after derivatization with ninhydrin reagent using ethanol as the solvent. The method was linear in the range of 5µg/ml-15µg/ml for both the drugs. The method was validated as per ICH guidelines with respect to linearity, accuracy, precision, limit of detection and limit of quantitation. The method was successfully applied for the estimation of pregabalin and epalrestat in the tablet dosage form.

CP-119 ROLE OF AI IN DRUG DISCOVERY AND DRUG DELIVERY SYSTEM

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Artificial intelligence (AI) in medicinal chemistry has recently gained significant attention as an implicit means of revolutionizing pharmaceutical as assiduity. Drug discovery, the process

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CP-122 TO CHECK THE INVITRO ANTIMITOTIC ACTIVITY AND PERFORM MOLECULAR DOCKING STUDIES OF ISOLATED COMPOUNDS FROM HERBAL PLANT RHYCHOSIA BEDDOMEI

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In this article, the goal was to examine the antimitotic activity of the herbal plant Rhynchosia beddomei. The methanolic extract of Rhynchosia beddomei was screened for in vitro antimitotic activity like Allium cepa root tip assay. Molecular docking was carried out between the Bcl-2 Receptor, VEGFR-2 and bioactive compounds like apigenein, vitexin, isovitexin, quercetin, vicenin, orientin, rutin etc. Three different extracts were compared which were the methamolic extract of Rhynchosia beddomei, Methothrexate and water. Extract of Rhynchosia beddomei showed significant antimitotic activity, by decreasing rate of mitosis in comparison to water. Methotrexate (0.1 mg/mL) was used as a standard and shows highest antimitotic activity. Thus, the selected plant displayed significant antimitotic activity by showing good inhibition. Vitexin, rutin and lucenin have showed good binding affinity towards Bcl-2 and biochanin, isovitexin, orientin and apigenin have showed good binding affinity towards VEGFR-2 respectively. Molecular dynamic simulation studies showed that Bcl-2 and VEGFR-2 can act as an attractive molecular target for vitexin, rutin, biochanin, isovitexin, orientin and apigenin respectively.

CP-123 FORMULATION AND EVALUATION OF THE RISPERIDONE SOLID DISPERSION USING DIFFERENT CARRIERS

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Solid dispersion (SD) is used in improving drugs' physicochemical properties including solubility and dissolution and it is considered as a smart method of pharmaceutical technology. the drug risperidone (RIS) is prescribed for the short-term management of acute manic linked to bipolar disorder in both (negative and positive) signs. RIS drug states that it has low solubility. Twenty-Eight formulas of RIS were prepared as a solid dispersion using different carrier includes poloxamer 188, polyethylene glycol 6000, polyvinylpyrrolidone(pvpk30), and poloxamer407 at different drug, by using two different preparation method. (solvent evaporation method and fusion method).
The Result indicates that, the used carriers show enhancement in drug solubility in the following rank order i.e. best drug polymer ratio. And the best preparation was solvent evaporation method. and the optimum formula is prepared by solvent evaporation method.
It can be concluded that the solid dispersion can under the selected criteria here can be followed to solve the problems of RIS solubility which could possibly result in better RIS bioavailability.

CP-124 ROLE OF HYDROGELS IN CANCER THERAPY

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Hydrogels are water-insoluble, hydrophilic, cross-linked, three-dimensional networks of polymer chains having the ability to swell and absorb water but do not dissolve in it, that

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comprise the major difference between gels and Hydrogels. The mechanical strength, physical integrity and solubility are offered by the crosslinks. The different applications of Hydrogels can be derived based on the methods of their synthesis, response to different stimuli, and their different kinds. Hydrogels are highly biocompatible and have properties like human tissues that make it suitable to be used in various biomedical applications, including drug delivery and tissue engineering. Hydrogel materials can be used as a precise and controlled drug release systems,, which can continuously and sequentially release chemotherapeutic drugs. Normal cells and tissues may suffer damage from common forms of chemotherapy. In contrast to systemic chemotherapy, localized chemotherapy can reduce side effects by delivering a steady stream of chemotherapeutic drugs directly to the tumour site. This highlights the significance of controlled-release biodegradable Hydrogels as drug delivery methods for chemotherapeutics.

CP-125 VALIDATION AND METHOD DEVELOPMENT OF ANALYTICAL METHODS AS PER ICH GUIDELINES

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Methods need to be validated. The International Conference of Harmonization (ICH) of technical requirements for the registration of pharmaceutical for human use has developed and provided a text on validation of analytical procedures. The proposed analytical methods are simple and accurate. The advantages in it is simplicity in the sample preparation and the cost economic reagents. The contribution is the limit of detection for all the methods. Results from statistical analysis of the experimental results for all the methods were indicative of satisfactory precision and reproducibility. Simple sample preparation and the use of inexpensive reagents are the main benefits. Consequently, it was demonstrated that the suggested techniques could be effectively used to estimate the commercial pharmaceutical formulations including aspirin and rosuvastin, metolazone and spirolactone, metoprolol and olmesartan, and doxofylline and ambroxol hydrochloride. Thus, the above studies findings would be helpful to the analytical chemists to apply the analytical methods for the routine analysis of the analytes in pharmaceutical dosage forms after their approval from FDA. However, the following aspects of the method may also be tried for future analysis. HPTLC, Gas Chromatographic analysis, liquid Chromatography Coupled to Tandem Mass Spectrometry, High Performance Liquid Chromatography with Fluorescence, and Colorimetric method development.

CP-126 THE INNOVATIVE APPROACH TO TREATING ULCERATIVE COITUS THROUGH CHRONOPHARMACEUTICS

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The current advances in chronobiology and the knowledge gained from chronotherapy of elected disorders explosively suggest that "the one size fits each at all times" approach to medicament delivery is no longer substantiated, at least for opted bioactive agents and disease curative. Ulcerative colitis (UC) is a long-term relapsing and blinking gastrointestinal illness of uncertain etiology. The pathogenicity of ulcerative colitis is believed to be an aberrant susceptible response in which antibodies are formed against colonic epithelial protein(s). The

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Taking medicine is a part of life for many people. However, some medicines can be harmful or even deadly, which is why the government bans them. In India, the Central Drugs Standard Control Organization (CDSCO) is responsible for ensuring the safety and efficacy of medicines. It also maintains a list of banned medicines that are no longer allowed to be manufactured, sold, or used in the country. To safeguard public health and ensure the safety and efficacy of medications, the Indian government periodically bans certain drugs. This article provides a comprehensive guide to the list of banned medicines in India as of 2023, with a focus on clarity and accessibility for the public.List of Banned Single Drugs:

Amidopyrine
Phenacetin
Nialamide
Chloramphenicol (Except for ophthalmic and topical preparations)
Phenylpropanolamine
Furazolidone
Oxyphenbutazone
Metronidazole (topical application for acne)

Keywords:Amidopyrine,Nialamide,Furazolidone,oxyphenbutazone,Medicines

CP-133 HERBAL FACE CREAM OVERVIEW

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This is an in-depth examination of face creams, exploring their purposes, components, and many revenue streams. Herbal face creams are essential to skincare routines since they provide several advantages for the skin of the face. They are designed to replace moisture, moisturize, and nourish the skin, preventing dryness. Additionally, they serve as a barrier of defense, defending the skin from environmental aggressors like pollution and UV rays. They also help to improve the texture, tone, and elasticity of the skin, giving the appearance of more youthful and radiant skin. The components of face creams vary according to their particular properties, Hyaluronic acid and glycerin are examples of humectants found in moisturizing face creams; these substances draw and hold moisture to the fine lines, wrinkles, and age spots on the skin. Sunscreen-infused face lotion lowers the chance of developing skin cancer and protects against damaging UV radiation. When selecting a face cream, those with acne-prone skin types should look for formulas that are lightweight and oil-free. It is important to take into account variables like sensitivity, allergies, and certain skin conditions while selecting a face cream. To verify compatibility and efficacy, it is advised to do the patch test and speak with dermatologists.

Keywords: Hydration, protection, daily skincare routine, healthy, nourished, youthful-looking skin.

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Key words: Anti-urolithiatic activity, Caesalpinia pulcherrima, Ethylene glycol, Hyperoxaluria and Kidney stones.

CP-136 FORMULATION AND EVALUATION OF THE RISPERIDONE SOLID DISPERSION USING DIFFERENT CARRIERS.

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Solid dispersion (SD) is used in improving drugs' physicochemical properties including solubility and dissolution and it is considered as a smart method of pharmaceutical technology.The drug risperidone is prescribed for the short term management of acute manic linked to bipolar disorder in both negative and positive signs. RIS drug states that it has low solubility.Twenty eight formulas of RIS were prepared as a solid dispersion using different carriers includes poloxamer188, polyethylene glycol6000, polyvinylpyrrolidone(pvpk30), and poloxamer407 at different drug, by using two different preparation method. (solvent evaporation method, fusion method).The result indicates that, the used carriers show enhancement in drug solubility in the following rank order i.e. best drug polymer ratio. And the best preparation was solvent evaporation method and the optimum formula is prepared by solvent evaporation method. It can be concluded that the solid dispersion can under the selected criteria here can be followed to solve the problems of RIS solubility which could possibly result in better RIS bioavailability.
Keywords: Risperidone, solid dispersion, pvpk30, solvent evaporation, fusion method, solubility.

CP-137 3D PRINTING PHARMACEUTICAL TECHNOLOGY

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As we all know that the world undergoes development each and every day. There always a new innovation and introduction of many technologies to the world. One of those technologies is 3d Printing Technology, This technology has many wide range of applications and benefit in the pharmaceutical industries. 3D Printing Technology can help in marking the customized and personalized doses a reality.3D Printing ,also called as Additive Manufacturing(AM), is a method of creating 3d solid parts from a digital document. By utilizing additive routes, the fabrication of 3D-Printed objects can be made. These layers can be viewed as a gently cut level cross-area of the manifest object.

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Introduction: Proton pump inhibitors (PPIs) are hydrogen-potassium-ATPase inhibitors that suppress gastric acidsecretion. They are among the most routinely prescribed drugs in the world due to their excellent efficacyand low risk of side effects; yet, they are frequently used inappropriately. Although extensive studies are available in Western countries on PPI appropriateness, such data from India are still very limited.Objectives:To analyze appropriateness of PPI prescription among general medicine inpatients.Materials and methods:This is a hospital based cross-sectional study. A total of 402 patients were participated andappropriateness was assessed primarily by using standard guidelines (FDA, NICE and ACG guidelines).Additionally, MAI assessment was performed in PPI users.Results:Logistic regression was performed and significant variables were observed. Strong relationships between the appropriateness of PPI usage and gender and comorbidity were shown by the logistic regressionanalysis, while a significant relationship between appropriateness and age was also seen. According tostandard guidelines, appropriate usage of PPI was recorded highest during hospitalization (33%) and leastduring discharge (8%).Conclusion:This study explored appropriateness of PPI prescriptions among general medicine inpatients of asecondary care referral hospital in Andhra Pradesh. Inappropriate PPI usage is still more prevalent in ourcountry which can lead to unnecessary economic expenditure to the patients. Henceforth, it is imperativeto enhance appropriate PPI prescription, particularly with regard to minimising misuse, to attain anoteworthy reduction in healthcare expenses and anticipate a decreased occurrence of possibleunfavourable outcomes.

Keywords: PPI, FDA, NICE, ACG, MAI, Appropriateness

CP-146 STEREOLITHOGRAPHIC (SLA) 3D BIOPRINTING

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Stereolithographic(SLA) 3D bioprinting is a slice- edge technology that merges perfection engineering with biotechnology. This system utilizes photosensitive biomaterials to produce intricate three- dimensional structures at a bitsy position. By employing a subcaste bysubcaste approach, SLA 3D bioprinting enables the fabrication of complex natural constructs with high spatial resolution. This fashion holds living cells into the printing process opens avenues for creating functional apkins and organs. The absimmense pledge in towel engineering, allowing the customization of pulpits for organ rejuvenescence. also, the capability to incorporate tract highlights the eventuality of SLA 3D bioprinting in revolutionizing regenerative drug and its impact on advancing the field of substantiated healthcare. Its a fashion that uses ultraviolet light to cure layers of a photosensitive liquid resin, creating intricate three- dimensional structures for towel engineering and regenerative drug operations. Its a fashion that uses a ray to solidify layers of bioinks, creating intricate three-dimensional structures for towel engineering andregenerative drug. It enables precise control over the spatial arrangement of cells and biomaterials, easing the fabrication of complex natural constructs.

KEYWORDS: Stereolithographic, photosensitive biomaterials, subcaste-bysubcaste approach, 3D bioprinting, towel engineering, spatial arrangement.

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CE-101 LIGHT ACTIVATED MOLECULAR JACKHAMMERS:

A NANO EVOLUTION IN THE WORLD OF CANCER KILLING PHENOMENON

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ABSTRACT

In these 21 centuries, Nano engineering and molecular biology are setting a new trend in treatment of cancer and conditions related to cancer. New discoveries in treatment of cancer which are efficient in giving the most appealing results in treatment of cancer are "nano-drills", "nuclear medicine", "nuclear fusion therapy", "photo-immune therapy", "molecular drills", and "Light activated molecular jackhammers". "Light activated molecular jackhammers" are the advanced treatment in the 21st century it works just as jackhammers can penetrate concrete, molecular jackhammers (MJH) are nanoscopic machines capable of creating blows so strong they can crack or rupture the cell membrane, decompensating and killing the cell. The MJHs are turned on by near-infrared (NIR) light that stimulates synchronized delocalized vibrations throughout the cell a mechanical action that can be exploited to rapidly kill cancer cells. The research taps into the emerging field of MOLECULAR PLASMONICS. When certain molecules absorb specific wavelengths of light, they enter an excited state where negatively charged electrons oscillate rapidly in unison, known as a molecular plasmon resonance. This resonance results in concerted molecular vibrations that can perform mechanical work, akin to a jackhammer.

Different than traditional chemotherapy, it is unlikely that a cell could develop a resistance to molecular mechanical forces, thereby providing a new modality for inducing cancer cell death.

The effect is also studied in vivo in murine B16-F10 and human A375 melanoma in mice, underscoring the high efficiency of this approach, achieving a survival rate of 60% at day 120, and 50% of the mice becoming tumor free. The molecules that destroy cell membranes through VDA are termed molecular jackhammers (MJH) because they undergo concerted whole-molecule vibrations.

These MJF was discovered by Research scientist Ciceron Ayala-Orozco poses in James Tour's lab in the Ralph S. O'Connor Building for Engineering and Science at Rice University on Tuesday, Jan. 09, 2024. Ayala-Orozco was the lead author in a study for destroying cancer cells with "molecular jackhammers."

KEY WORDS: Molecular jack hammers, Molecular Plasmonics, Near infrared, Vibronic-driven action

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CE-102 A REVIEW ON IDENTIFICATION OF CANCER CELLS: THE ROLE OF NANOSENSORS

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ABSTRACT

Nanosensors are the nanoscale devices that measure the physical and chemical quantities. The nanosensors can be used to detect and analyse the position of the cancer cells in the body. Nanoscale technology has emerged as a beacon of hope in the realm of cancer treatment. Nanosensors inspite of having the nanosize, have a remarkable sensitivity, have revolutionized the landscape of cancer diagnosis, monitoring therapy. The nanosensors in cancer treatment focusing on pivotal role in early detection, targeted drug delivery system. This technology can identify specific cells at the molecular level to deliver medicine and monitor the development of particular places in the body by measuring physical characteristics such as volume, concentration, movement and speed, gravitational, electric, magnetic forces, pressure, temperature, etc. Despite their promising capabilities, challenges like biocompatibility, stability, and scalability need to be addressed for widespread clinical adoption. Ongoing research focuses on refining nanosensor design, improving delivery methods, and ensuring their safety for in vivo applications. In summary, the use of nanosensors in identifying cancer cells holds immense potential for early and accurate diagnosis, offering a pathway towards more effective and personalized cancer management strategies. This review discusses the current state of nanosensor technology, its challenges and future prospects in transforming cancer diagnosis.

KEY WORDS: Nanosensors, nanoparticles, biosensors, cancer management, nano carbon tubes

CE-103 REVIEW OF DRUG DISCOVERY PROCESS

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ABSTRACT

Drug discovery is a process which aims at identifying a compound therapeutically useful in curing and treating disease as per regulatory authority's guidelines. This process is a lengthy, risky, time consuming, economic, a lot people, equipments, raw materials, guidelines, involves the identification candidates, synthesis, validation, optimization, screening and assays for therapeutic efficacy. Once a compound has shown its significance in this investigation, it will initiate the process of drug development earlier to clinical trials. New drug development process must continue through several stages in order to make a medicine that is safe, effective, and has approved all regulatory requirements. Preclinical studies using

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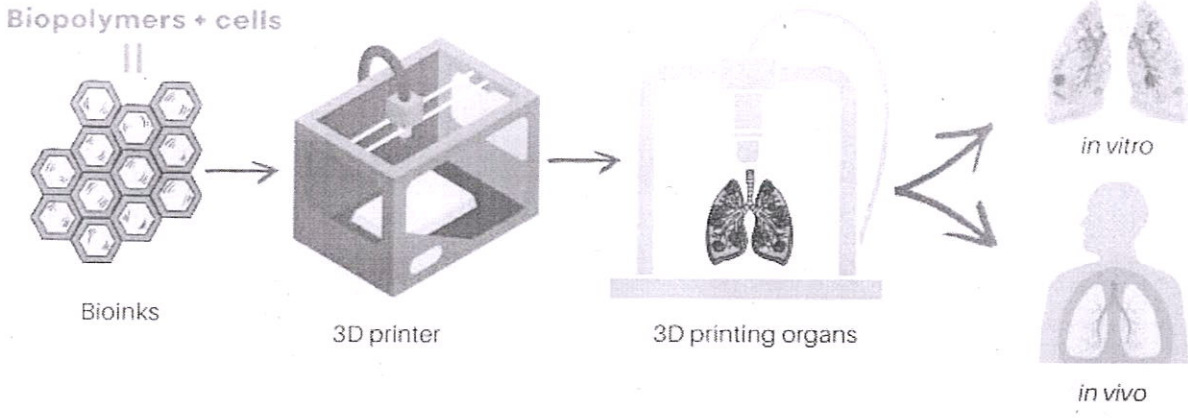

KEYWORDS: bio inks, biomaterials, layer-by-layer, hollow organs

CE-105 RADIOPHARMACEUTICAL THERAPY IN CANCER: CLINICAL ADVANCES AND CHALLENGES

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ABSTRACT

The project aims to integrate radiopharmaceuticals into chemotherapy strategies to optimize treatment outcomes and personalize cancer therapies. Radiopharmaceuticals, infused with radioisotopes, are crucial for diagnostic imaging and allowing precise visualization of therapeutic agents. The research focuses on tailoring treatments to individual patients, maximizing therapeutic benefits while minimizing adverse effects. The project also explores monitoring cellular and molecular changes in response to chemotherapy, using radioisotopes to track drug delivery and study mechanisms of action. Theranostic agents, which combine diagnostic and therapeutic capabilities, are also explored.

Keywords: Radio pharmaceuticals, Radioisotopes, Theranostic agents, Cancer therapy.

CE-106 MEDICINE VENDING MACHINE- (MEDICAL ATM)

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ABSTRACT

Medicine plays an important role in human's life for every situation. An automated medical system is introduced to reduce the man power time and energy. It is similar to an ATM through which we get the required money at any time & any place. The same system is followed for the pharmaceuticals also. Medicines for B.P, diabetics, cold, fever, headache,

and first aid medicines like bandage, cotton, ointments, and other routinely used tablets can be obtained. When RFID card is inserted, the details of the particular user are read by the RFID reader and displayed.

After the identification of the valid person, list of medicines will be displayed on the TFT display, then user selects the required medicines by entering the corresponding number of selected medicines by using the keypad . After entering the required list, the amount will be calculated according to the medicine and their quantity. The amount will be deducted from the RFID card and immediately the transaction details will be sent through GSM to the user. After payment deduction the selected medicine are delivered automatically from the system. For this delivery system the arduino controller uses a slider arrangement with the help of servo motors which provide rotational mechanism

Keywords: TFT, RFID Reader & Cards, GSM, servo motors

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