International Journal of
Life science and Pharma Research

School of Pharmaceutical Sciences
Chettinad Academy
of Research and Education

VIRTUAL INTERNATIONAL CONFERENCE ON PHARMA INDUSTRY 4.0

16 & 17 July 2021

Dated on October 16-17, 2021

GUEST EDITORS

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PROFESSOR AND DEAN I/C
CHETTINAD SCHOOL OF PHARMACEUTICAL SCIENCES
CHETTINAD ACADEMY OF RESEARCH AND EDUCATION
KELAMBAKKAM - 603 103

DOI: http://dx.doi.org/10.22376/ijpbs/ijlpr/AB02/JULY/2021.1-26

AB-01

DESIGN, DEVELOPMENT AND CHARACTERIZATION OF IMMEDIATE RELEASE MATRIX TABLET OF DPP-4 INHIBITOR

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Abstract: Diabetes mellitus (DM), especially type II, is one of the most common chronic diseases. Its first-line oral treatment is metformin, but in now a days some other drugs are also used for the treatment of type-II Diabetes mellitus. In present study wet granulation technique is used for preparing immediate release matrix tablet of DPP-4 inhibitor with the help of superdisintegrants. Formulation optimization was done in three steps. In first step, amount of pregelatinized starch was optimized by preparing four trial batches. Prepared blend of granules and the pre and the formulations were evaluated for pre and post compression parameters. Amount of pregelatinized starch was optimized to 24 mg. In the next step, amount of SLS was optimized in the same way to 1 %. Finally amount of superdisintegrant- croscarmellose was optimized by preparing four batches and evaluating them for pre and post compression parameters. In-vitro drug release study of prepared formulation compare with the marketed formulation. It was observed that drug release from batch I10 and I11 batches was comparable with marketed product. Tablet formulation I11 showed higher disintegration time as compared to I10. Formulation I10 was selected as optimum formulation and evaluated for stability. Croscarmellose sodium was found effective superdisintegrant in formulation of immediate release matrix tablet of DPP-4 inhibitor i.e. vildagliptin. The drug improve the glycaemic control and inhibition of DPP-4 results in increased fasting and postprandial endogenous level of incretin hormones. After meal it will maintain the blood glucose level.

Keywords: Diabetes mellitus, Immediate release tablet, superdisintegrant, Croscarmellose, vildagliptin etc.

AB-02

HAEMOSTATIC EFFECT OF LEAVES OF TWO MEDICINAL PLANTS

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Abstract: Many researches have shown that plants and its products have high potential to arrest bleeding. The haemostatic activity of leaves of *Artemisia nilagirica* and *Euphorbia cyathophora* on the blood clotting time and bleeding time were evaluated in the present study. *Artemisia nilagirica* locally known as Indian wormwood belongs to Asteraceae family. It is an aromatic herb composed of mainly volatile oils and biologically important compounds and the plant is perennial and found mainly in the hilly areas of India. It is a medicinal plant which has been reported to be used over ten decades and is treating diseases and symptoms like malaria, inflammation, diabetes, stress, depression and many other microbial diseases. *Euphorbia cyathophora*, belonging to family Euphorbiaceae known by various names including dwarf poinsettia, fire-on-the-mountain, and painted leaf, is native to North India and North and South America. It is used for its wound healing property by the local traditional healers. The method of Lee and White was employed to measure the clotting time of hydroalcoholic extracts of *Artemisia nilagirica* and *Euphorbia cyathophora* on human blood. The method of Ivy was used to determine the bleeding time in female rats. There was significant reduction of clotting time and bleeding time in the presence of both the extracts when compared with the control groups. The isolation of active principle which may be responsible for the determined activity is of prime importance since haemostasis is a life saving process.

Keyword: Haemostasis, Artemisia, Euphorbia, Extracts, Bleeding time, Clotting time

AB-03

BIO-FABRICATION OF SELENIUM NANOPARTICLE USING DIOSPYROS MONTANA BARK EXTRACT, CHARACTERIZATION AND ITS APPLICATIONS.

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Abstract: Selenium nanoparticles (SeNPs) with novel biological activities, cancer cell selectivity, and low toxicity towards normal cells have gained attention for chemo-therapeutic and chemo-preventive applications. Hence this study is intended to rationalize the bio-fabrication of Se-NPs from phytoconstituents in plant extract and study its biological activity. Phytochemical screening revealed the presence of enormous phytoconstituents in the aqueous extract. The total phenolic and flavonoid content was found to be substantial. The green synthesis of Diospyros montana Selenium Nanoparticles (DM-SeNPs) was accomplished by a simple reduction of selenious acid (H2SeO3) with D. Montana (DM) extract. Biosynthesis was completed in 24 h which was noted with the change in colour of dispersion from colourless to intense red. This method was accomplished by the synthesis of DM-SeNPs in a size range of approximately 100–150 nm, under ambient conditions. The synthesized DM-SeNPs were easily segregated from the dispersion by subjecting them to high-speed centrifugation. These DM-SeNPs were characterized by Ultraviolet-visual (UV–Vis) spectroscopy, Fourier Transform Infrared Spectroscopy (FTIR), X-ray Diffraction (XRD), Field Emission Scanning Electron Microscopy (FE-SEM), and elemental analysis by Energy Dispersive X-ray spectroscopy (EDAX). The presence of imperative functional groups in the D. montana bark extract was confirmed from FTIR spectra, which may have reduced and stabilized nanoparticles. DPPH free radical scavenging and reducing power assay showed the potential antioxidant property of the DM-SeNPs. The data obtained through this research work discloses the potential therapeutic value of DM-SeNPs and the future scope for the development of its formulation.

Keywords: Diospyros montana, Bio-fabrication, Selenium Nanoparticles, Antioxidant.

AB-04

LIGAND-BASED PHARMACOPHORE MODELING, SCREENING OF POTENTIAL GLIFLOZINS, HOMOLOGY MODELING AND DOCKING STUDIES TO GET EFFECTIVE ANTI-DIABETIC AGENTS

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Abstract: Type II Diabetes mellitus is a metabolic disorder, which is a major health concern all over the world. The Prevalence of Diabetes is increasing day by day. The SGLT-2 Protein has received much attention in recent years as a potential anti-diabetic target. SGLT-2 inhibitors are responsible for inhibiting 90% of urine reabsorption in proximal convoluted tubule. In the present study, the 3 D Pharmacophore model was established based on a set of known Gliflozins using the PharmaGist Webserver. The best model with a high score was considered to screen the ZincPharmer database. The Physicochemical Properties of all "ZincPharmer database screened compounds" were calculated by using PaDEL Descriptor software and the compounds were filtered based on Lipinski's Rule of Five criteria. The 3 D Crystal Structure of hSGLT2 Protein was built by homology modeling, as it is unavailable in protein data bank. The screened compounds were docked with modeled hSGLT2 protein using PyRx software. Based on the results of docking, some of the compounds like ZINC16958818, ZINC16958774, ZINC33832535 and ZINC16958731 showed good results with the least binding energies. These compounds can be used for the further development of anti-diabetic agents. SGLT-2 inhibitors involved in glucose and sodium chloride excretion through urine in 1:1 proportion, leads to decrease in one of the very important diabetic complication like hypertension. Thus, designing novel SGLT2 inhibitors is very important for diabetes and hypertension management.

Keywords: Pharmacophore, Ligand-based, PharmaGist, Gliflozins, Type II Diabetes, Homology Modeling, Docking, ZincPharmer, SGLT2 inhibitors.

AB-05

JUXTACRINE AND PARACRINE EVENTS IN THE COLORECTAL CARCINOGENESIS WITH THEIR HERBAL REMEDIES: A REVIEW

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ABSTRACT: Colorectal cancer is one of the lethal types of malignancies leading to a high mortality rate globally due to various risk factors involving inherited genetic disorders which involves FAP (Familial Adenomatous Polypsis), HNPCC/Lynch syndrome (Hereditary Non-Polyposis Colorectal Cancer), Turcots syndrome, Peutz jeghers syndrome and some inflammatory bowel diseases. On such occasions, the development of tumor comprises five different stages that are progressed via multiple signalling pathways. The molecular events for the cancer progression incorporate two major types of cell signals, i.e., Juxtacrine and Paracrine where cell-cell or cell- extracellular matrix communicates to produce signals. The former event implies the Notch and Hippo signalling pathways. The latter entails the cascade cell communication process such as Wnt/ β -Catenin, MAPK (mitogen-activated protein kinase), TGF-β/SMAD (Transforming growth factor beta), PI3K/AKT (Phosphoinositol 3-kinase), TP-53 (Tumor protein 53), VEGF/VEGFR (Vascular endothelial growth factor), JAK/STAT (Janus kinase/Signal transducer and activator of transcription), Nrf2/KEAP1 (Kelch-like ECH-associated protein 1), SHH (Hedgehog), cMET/HGF (Hepatocyte growth factor)**,** resulting in metastatic cancer. Timely identification of the resultant and appropriate treatments such as cytotoxic medicines, radiation, chemotherapy, and surgery can prevent severe cancer causes. Recently, the emergence of herbal/ natural treatments paves the way for cancer control without any significant side effects over usual treatments. Among other natural remedies, Traditional Chinese medicine is considered to be an ancient method of herbal treatment for the progression of cancer. Thus, this article aims to provide an overview of the cell communication process and to elicit the herbal remedies that help in colorectal cancer therapy.

KEYWORDS: Cell signal, Colorectal carcinogenesis, Herbal remedies, Juxtacrine, Paracrine.

AB-06

ANALYTICAL QUALITY BY DESIGN ASSISTED SPECTROPHOTOMETRIC DETERMINATION OF EMTRICITABINE FROM PHARMACEUTICAL FORMULATIONS

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ABSTRACT: The pharmaceutical industry is governed by quality control policies to a large extend. Quality by design is a scientific approach in pharmaceuticals. Design of experiments is one of the most efficient methods for identifying the effects of variables on the response by selecting variables and further optimizing their impacts. Emtricitabine act as an inhibitor of reverse transcriptase enzyme with antiviral properties against HIV and hepatitis B virus. The objective of the present study was to develop a rapid, sensitive, and reliable visible spectrophotometric method for the estimation of emtricitabine employed analytical quality by design space concept. The effects of critical method variables (factors) were screened and optimized by factorial design. In this method the drug emtricitabine reacts with 3-methyl-2-benzothiazolinone hydrazine hydrochloride in the presence of ferric chloride in an acidic medium produce green coloured complex and the maximum absorbance was detected at 620 nm. A fractional factorial design was employed for the initial screening of independent variables. The main, interaction and quadratic effects of the most influencing factors on the preferred response (absorbance) were studied by using central composite design (CCD) with response surface methodology (RSM). The method was found to be linear r^2 =0.9986, accurate mean recovery = 100.06%, and precise and found to be within the limits as per the ICH guidelines. The outcome of the proposed method revealed that the quality by design concept can be efficiently enforced in the optimization of visible spectrophotometric technique for the quantification of EMT in pharmaceutical raw materials and formulations by minimum experimental runs, therefore, the developed method can be employed routinely for quality control analysis.

Keywords: Quality by design, Emtricitabine, MBTH, ferric chloride, Visible spectrophotometric.

AB-07

METHOD DEVELOPMENT AND VALIDATION OF GLUCOSE ESTIMATION IN CHEWABLE TABLETS BY RP-HPLC AND PROCESS VALIDATION.

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ABSTRACT: D-glucose, which is the most predominant isomer of glucose found in nature or derived from hydrolysis sucrose or starch is taken up into epithelial cells primarily by the sodium-dependent glucose cotransporter SGLT1. There is wide use of it for Fatigue and Hypoglycemia. Glucose is capable of regulating hormone secretion, gene transcription, the activity of glucoregulatory neurons and in enzyme activity. In this study to develop and validate a simple, accurate, rapid and economic method for the glucose chewable tablets by (RP-HPLC) and the validated method used for the process validation in each stage of production of tablet dosage form (Blend sample, core tablet, coated tablet). In this method, Chromatographic runs were performed on Bondapak NH2, 10 µ3.9 mm X 300 mm column, with mobile phase comprising water: acetonitrile (70:30) in a flow rate of 1ml/min was detected using RI Detector. The method shown to be linear at the range of 80% (1.6mg/ml) to 120% (2.4mg/ml) of operating concentration with correlation coefficient of 0.999, accurate at recovery rate 98.0% and 102.0%, specific, precise and robust to change mobile phase ratio and flow rate. The developed method was validated successfully showing a good and satisfactory results for all method validation parameters. Percent recovery was 99.64% and the retention time was found to be 2.822 minutes. The developed and validated method is used for process validation in each stage and reported shows good results. The method was developed and validated according to the ICH guidelines. So, the developed method can be used for routine analysis and process validation.

KEYWORDS: Glucose, Hypoglycemia, chewable tablets, reversed phase high performance liquid chromatography, Process validation.

AB-08

SPECTROPHOTOMETRIC METHOD FOR THE QUANTIFICATION OF LAMIVUDINE EMPLOYING ANALYTICAL QUALITY BY DESIGN APPROACH

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ABSTRACT: The current research focuses on using the analytical quality by design space idea to produce visible spectrophotometric techniques for Lamivudine. Lamivudine is (2R, 5S)-4-amino-1[2(hydroxyl methyl)-1, 3-oxathiolan-5yl]-2(1H)-pyrimidinone. Lamivudine is a cytidine analogue. It blocks both types (1 and 2) of HIV reverse transcriptase and also hepatitis B virus reverse transcriptase. It is used as an Anti-retroviral agent and Nucleoside reverse transcriptase inhibitor .A systemic approach to pharmaceutical development is known as quality by design. Factorial design was used to select and optimise the critical procedure variables. When ferric chloride is present in an acidic solution, lamivudine interacts with 3-methyl-2-benzothiazolinone hydrazone hydrochloride to generate a green coloured complex with a maximum absorbance of 620 nm. For the initial screening of independent variables, a fractional factorial design was used. Utilizing central composite design (CCD) and response surface methods, the most influential and important, interaction, and quadratic effects relevant parameters on the desired response (absorbance) were evaluated. This work is proposed and demonstrated that clearly quality by design principle can be effectively implemented in the optimization of a ultra-violet visible approach for the quantification of Lamivudine raw ingredients and formulations for pharmaceuticals using the least possible experimental runs. The method was found to be linear r^2 =0.9972, accurate mean recovery = 99.31%, and precise and found to be within the limits as per the ICH guidelines. According to the ICH criteria, the validated method was within the acceptable range. As a result, the proposed method can be used to perform routine quality control.

Keywords: Absorbance**,** Factorial design**,** Quality by design, Lamivudine, Screening, Visible spectrophotometric.

AB-09

GENETIC ASPECTS OF ALCOHOL-DEPENDENT DISORDER: A NEUROGENETIC APPROACH

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ABSTRACT: Alcoholism is a severe condition, remitting neurobehavioral illness with a higher incidence and a substantial public health influence globally. It is complicated and multigenic, with an inheritance of nearly 50%, and is affected by environmental causation diversity. Alcohol dependency is most commonly seen in the indigenous communities of the United States of America, New Zealand, Australia, and Canada and countries like Russia, Hungary, Lithuania, South Korea, and Latvia, with the prevalence of 16.29%, 15.29%, 13.35%, 13.10%, 11.54% respectively. The diagnosis of alcohol dependency helps study the specific drug use disorders more efficiently than the traditional psychiatric diagnostic tools. There is a genetic link to the risk factors associated with its pathogenesis. Since genes play a vital role in dependency or addiction, a considerable population is influenced by such genes. Some genes we are focusing on for this study are *VRK2*, *DCLK2*, *ISL1*, *FTO*, *IGF2BBP1*, and *PPR1R3B*. The gene responsible for alcohol dependency in the chromosome is identified using linkage studies. One such linkage study found that the most common chromosome to hold the gene susceptible to alcohol is chromosome 4. This chromosome contains the alcohol dehydrogenase (ADH) gene in the 4q area of the chromosome; such studies help us control such genetic influences on alcohol dependency. In the mammalian brain, GABA (-aminobutyric acid) synapses are a principal mechanism neurotransmitter and thought to facilitate a few of alcohol's biological and pathological effects. This study mainly focuses on the influence of genes and shows the characteristics of the mentioned genes that have a role in this disorder. The diagnosis of alcohol dependency helps in studying specific drug use disorders more efficiently than the traditional psychiatric diagnostic tools.

Keywords: Alcoholism, neurobehavioral illness, linkage analysis, genetic polymorphism, alcohol dehydrogenase, brain disease

AB-10

GENETIC ASPECTS OF AUTISM SPECTRUM DISORDERS: A NEUROGENETIC APPROACH

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Abstract: Autism spectrum disorder (ASD) is a diverse set of neurodevelopmental disorders indicated by difficulty in social interaction and communication and highly repetitive behavior and restricted interests. ASD was predicted to affect around 222 out of every 10,000 children in the United States in 2020, making it one of the highest prevalence rates in the world. It affects about 3.63 % of boys aged 3 to 17 years, compared to 1.25 % of girls. It has a substantial and intricate genetic component, with different familial inheritance patterns and an estimated of up to 1000 genes. This study aims to discuss the genetic factors such as single nucleotide polymorphism (SNP), epigenetic alterations, and the copy number variation that plays a crucial role in altering the phenotypic spectrum of this disorder. The search strategy included terms autism spectrum disorder, prevalence/epidemiology, genetics, future aspects, neurodevelopmental disorders were obtained from the NCBI database, including PubMed, Scopus, and Embase. The candidate genes associated with ASD are *CHD-8, SHANK-3, SLC6A4, RELN, DISC-1,* and *ITGB-3*. In large cohorts, high-throughput next-generation sequencing uncovers new risk genes' varied and complicated genetic landscape. Most genetic studies now focus on specific chromosomal regions based on the possibility that the corresponding genes are connected to the disease's visible characteristics. Acquired knowledge of genetic mechanisms of autism will afford proper illness prevention, diagnosis, and therapy; so that infants at risk can identify early and have a better understanding of the etiology of autism treatments. Currently, there is less clinical data to support the function of ASD. However, the prevailing research facts for many researched ASD new candidate genes support their links and identify ASD etiologic processes for establishing an early diagnostic marker.

Keywords: Autism spectrum disorder, epigenetics, genetic polymorphism, neurodevelopmental disorder, familial inheritance

AB-11

A CURRENT REVIEW ON THE ASSOCIATION OF GENETIC POLYMORPHISM IN CONGENITAL HEART DISEASE

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Abstract: Congenital heart disease (CHD) is the most frequent congenital disability, a significant cause of disease and death in infants. CHD is a term used to describe a range of cardiac anomalies that include valve defects, septal defects, and outflow tract defects. Most congenital variances are unknown; however, genetic factors are recognized as having an increasingly essential role. According to the World Health Organization, CHD is the prominent cause of newborn mortality, accounting for 42 percent of all infant deaths, and genetic or environmental factors caused 20-30% of these cases. Advances in modern biotechnology have revealed the genetic components of a substantial portion of this disease, pointing to the unique challenges of genetic factors of CHD. This study will concentrate on the scientific proof for genetic factors of CHD and will explain data to prove both single gene and complicated pathophysiological mutations of CHD. There are hundreds of mutations identified in recent years, especially in dominant traits, and more than 100 genes that have been identified related to this disorder in past years [7]. Especially some of the genes include *MYH6*, *GJA1*, *FABP3*, *NKX2-5*, *CAV1*, *IROX4*, *APOB*, *KCNQ1*, *MYPBC3*, and *GATA4* has the primary association, where some of them regulate the protein which helps in the function of the heart and regulates the pacemaker cells. The outcomes of CHD genetic analysis bring attention to biochemical processes, unlock the gates to a deeper comprehension of vascular development, and influence clinical care for affected individuals. In addition, the discovery of many genes essential for cardiac morphogenesis has resulted in a better knowledge of normal heart development at the molecular level.

Keywords: Congenital heart disease, environmental factors, gene polymorphism, dyspnea, cardiac arrest, heart rhythm

AB-12

GENETIC SUSCEPTIBILITY TO BREAST CANCER: AN ASSOCIATION WITH THE PALB2, CHEK2, ATM GENE POLYMORPHISM

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Abstract: Breast cancer is the most prevalent and genetic susceptibility identified in several candidate genes such as *PALB2*, *CHEK2*, and *ATM* are unique genes linked to this disease's 'moderate risk.' At the age of 70, the risk of this condition is systemic. According to research, women with breast cancer who have these genetic differences have a higher inheritance of the disease, putting them at a higher recurrence. The main aim of the research is to find out how *PALB2*, *CHEK2*, and *ATM* gene abnormalities cause breast cancer and illustrate biochemical mechanisms and which ethnicities are immediately affected. The genes discussed in this study are detected from Web of Science, PubMed, Google Scholar, and many other databases such as EMBASE, and only a few researches have been done using GWAS approaches. Women prone to high chances of breast cancer may have genetic mutations such as *PALB2*, *CHEK2*, and *ATM*. These genes are said to contact mutations in the *BRCA1* and *BRCA2* genes. It is still argued that recognizing genetic variations in these alleles could have a highly significant implication of greater risk of breast cancer in women with a genetic susceptibility for the condition. *PALB2* subsetting variations are linked with an increased risk of this disease than *ATM* or *CHEK2* genetic variations. Significant advancements in breast carcinoma results have been made in the last few decades; consequently, evermore better treatment options are available. So it would be beneficial to conduct studies that give deeper insight into overtreatment as a result of breast cancer testing or minimize its implications through altered treatment interventions. Circulating cancer cells becomes an unavoidable component of clinical procedures over the next five years.

Keywords: Breast cancer, genetic polymorphism, *BRCA1*, *BRCA2*, therapeutic measures, carcinoma

AB-13

ASSOCIATION STUDY OF CYP2D6 POLYMORPHISM IN MAJOR DEPRESSIVE DISORDER: A PATHOPHYSIOLOGY OF ASSOCIATED DISEASES WITH VARIOUS RISK FACTORS

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Abstract: A variety of research associated with clinical studies has shown that the CYP2D6 gene is closely involved in both antidepressant action and the pathogenesis of major depressive disorder (MDD). It is a common mental health disease with significant morbidity and mortality rate. Despite decades of thorough study, the neurobehavioral basis and disease pathogenesis of depression symptoms remain unknown. According to family, sibling, and intervention studies, genetic factors play a significant role in the progression of MDD and may expose critical info about pathogenic mechanisms. This study discusses significant advancements in neurogenetics, with a focus on MDD. Familial inheritance studies, linkage studies, association studies, and early twin studies are discussed to identify the association between the gene and MDD. To reveal a genetic polymorphism of MDD, the authors have collected relevant articles from electronic databases such as Web of Science, Google Scholar, PubMed, and several other databases such as PsycINFO over the past 15 years, along with those recent findings from genome-wide association studies are also reviewed for this study. By gathering the information from the previous records, it is found that the *CYP2D6* gene plays a vital role in the influence of aggression, and it is also reported as MDD is influenced by anxiety, bowel disease, hypothyroidism, and coronary heart disease. Gene mutations are predicted to have only minor effects on overall disease risk, and multiple genetic factors, in combination with other diseases, are likely to be required to develop MDD. Large-scale research is needed in the future to analyze this complicated phenotype and try to identify mechanisms involved in the etiopathogenesis of MDD.

Keywords: Major depressive disorder, genetics, pathophysiology, gene polymorphism, cytochrome enzyme, familial disorder

AB-14

EFFECT OF ATYPICAL ANTIPSYCHOTICS USE ON SCHIZOPHRENIA AND ITS ASSOCIATION WITH SELECTED GENE POLYMORPHISM

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Abstract: Schizophrenia (SCZ) is a major, severe psychiatric disorder that requires lifetime care, and it is a severe mental illness that most doctors will frequently face during their practice. Extrapyramidal side effects (EPS) are frequent antipsychotic drug side effects. Recent studies have progressively shown that genetic factors, including neurotransmitter genes, can mediate SCZ predisposition and the related motor signs. Like serotonin (5-HT) receptors, serotonergic pathways may be implicated in EPS formation besides the dopaminergic system. As a result, nearly 1% of all people has the heritability of SCZ and identified that the selected genes were linked to the relevant pathways. SCZ is associated with dopaminergic, serotonergic, adrenaline, and noradrenaline genes. This study aims to identify the relationship between candidate genes and SCZ in humans by combining genetic association studies. The investigators have collected 128 articles from the electronic databases, among those 68 articles that have been selected based on the inclusion criteria. It is found that *HTR1A, HTR1B, HTR2A, HTR2C, HTR6,* and *ApoA1* genes are associated with the SCZ and also alter the AAPs mechanism during the time of administration. Thus, it is postulated that the genetic makeup of the patients with SCZ is closely linked with both motor dysfunction and antipsychotic drug-related negative impacts. However, to better understand the pathogenesis of the disease, there is a need for further research in the selected polymorphism among the more extensive sample size for case-control research with different ethnic groups. With modern technology's arrival, novel selected genes are investigated and might be used as early biomarkers for diagnosing and developing drug targets for therapeutics.

Keywords: Psychiatric disorder, schizophrenia, genetic polymorphism, motor deficit, neurotransmitters, serotonin

AB-15

USE OF FUNCTIONALIZED ANTI-BIOFILM NANOPARTICLES FOR BIOFILM ASSOCIATED INFECTIONS -RECENT DEVELOPMENTS

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Abstract: Biofilms are complex of multiple species of bacteria embedded within an extracellular matrix that is mainly composed of polysaccharides, nucleic acids, and proteins which causes many human infections. Based on the earlier reports, S. mutans indicate a high prevalence in dental biofilm. Current antimicrobial agents such as chlorohexidine are still restricted to control oral biofilms due to their poor drug solubility and fragile penetration into the bacterial cell membrane. Interestingly, anti-biofilm nanoparticles loaded with antimicrobial agents have been developed from synthetic or natural polymers, or hybrids can easily enter via cell membrane through water channels, and extracellular polymeric substance thus degrading the biofilm formation. For example, chitosan nanoparticles (positive surface charge), while cell wall (bacterial), and biofilm i.e. extracellular matrix are negatively surface charged can be easily interacting with the bacterial cell membrane thus disrupting the biofilm matrix formation and leading to bacterial cell death. Chitosan interaction with cell is based on charged based triggering protein leakage and other components of bacteria. Chitosan nanoparticles display strong with affinity to interact with the biofilm surface than the negatively charged nanoparticles. In addition, to enhance the anti-biofilm activity, functionalized nanoparticles with anti-biofilm peptide have been developed with multiple antimicrobial domains against microorganisms, mechanism by targeting the bacterial cells and biofilm matrix. Synthesized and characterized functionalized anti-biofilm nanoparticles are biocompatible, for biofilm treatment.

Keywords: Oral Biofilm, Dental infections, Anti-biofilm nanoparticles, S. mutans and Chitosan

AB-16

METAL-SILICA NANOCOMPOSITES AS CARRIERS OF ANTIFUNGAL DRUGS

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Abstract: Current pandemic situation has made humanity realize the role of fungi as a pathogen of concern to humanity. Health care sector using nanoparticles has been benefited in major fields like pharma, formulation development, therapeutics, sensing, image guided therapy, and for early disease diagnosis. Life saving devices and diseases encounter a life threating fungal infection that can enter bloodstream. Major concern in the current fungal treatment drug regime is - only limited number of classes of drugs are categorized as antifungals, and the evolution of fungi as resistance fungi to these classes of drugs. One such class of antifungals which have gained significant attention is amphotericin B and its drawback is due to resistance developed by Candida species and its poor water solubility. Recent reports also indicated the importance of lipid-based formulation for efficient antibiotic activity. Metal nanoparticles are shown to prevent hydrogen ion from fungal species thus causing biocidal activity against fungi. Silica nanoparticles are also known to exhibit antifungal activity, and, in this study, nanocomposites were prepared, silica with antifungal drug entrapped with gold nanocomposites were prepared and compared with the antifungal activity of drug alone. Minimum inhibitory (fungal) concentration of antifungal drug when entrapped in nanocomposites was much lesser when compared to the minimum inhibitory (fungal) concentration (85 µM) of antifungal drug alone. Interestingly, nanocomposites without antifungal drug also exhibited antifungal properties. Monodispersed synthesis of nanocomposite preparation remains a challenge Further in vitro studies are underway to evaluate and establish the antifungal activity of the nanocomposites with drug.

Keywords: Anti-fungal; Antibiotic; Nanoparticles; MIC; Toxicity

AB-17

PREPARATION OF BIOPOLYMER NANOCOMPOSITES AS CARRIERS OF ANTICANCER DRUGS FOR SYNERGISTIC ACTIVITY

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Abstract: Drugs with synergistic amalgamation increase the activity of each drug that aid in increasing the efficacy even at low concentration and minimise adverse effects. Choice of drugs need to be in such a way that there is no antagonistic effect using combination drugs. Cancer research is an active field with an aim to improve quality of life, manage cancer, and to reduce the side effects of anticancer drugs. Reports have indicated that drugs like paclitaxel and an active natural compound have registered anti-cancer activity with synergistic effect in vitro. Nanotechnology for developing materials in nano size range is a boon to carry drugs with synergistic combination. Polymer nanoparticles example PEGylated have been demonstrated to carry drugs with synergistic effects for anticancer therapy. Biopolymer nanoparticles have an advantage of being biocompatible and they are excellent materials as carriers of drugs. Biopolymer nanoparticles were prepared and encapsulated with drugs (doxorubicin) via ionic gelation method. Encapsulated drugs were cytotoxic drug and a pyrimidine analogue. Nanoparticles were characterized with DLS technique, and the hydrodynamic diameter of the prepared nanoparticles determined. Drug release pattern from biopolymers were determined. Nanoparticles were also characterized using analytical methods like FT-IR, and UV-Vis Spectroscopy. In -vitro studies using normal and cancer cells are underway to understand the additive or antagonistic or synergistic effect of prepared nanoparticles of biopolymers encapsulated with drugs.

Keywords: Synergism; Anti-cancer drugs, Biopolymer, Nanoparticles, Characterization

AB-18

METAL NANOPARTICLES ENTRAPPED BIOPOLYMER MATRIX WITH STEM CELL DIFFERENTIATING AGENTS FOR CARDIOMYOCYTE DIFFERENTIATION

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Abstract: Regenerative medicine is gaining prominence due to fact of understanding stem cells and its differentiating capabilities. Cardiomyocytes and its electrical properties play a major role for an appropriate rhythm of these cells. In this respect mesenchymal stem cells are researched a lot for its use as a therapeutic strategy to differential into cardiomyocytes. Certain agents like the analogue of cytosine nucleoside can aid in the differentiation of stem cells to cardiac cells. Such agents have demonstrated to provide protection against myocardial infarction by inhibition of fibrosis. Incorporating such agents in matrix/scaffold can reduce the toxicity. Here, biopolymer nanoparticles were incorporated with nanoparticles that can stimulate electrical properties needed for cardiac cell and stem cell differentiating agents can stimulate stem cells to differentiate. Nanoparticles loaded with and without the drug were characterized. DLS measurements indicated an increase in hydrodynamic diameter for nanoparticles with gold nanoparticles and differentiating agents. Nanoparticles with these agents were also hemobiocompatible as determined up to a particular concentration. Such nanoparticles can be prepared as hydrogels based on the concentration of biopolymer present and can also register better myocardial regenerative capability. Cell viability assay also demonstrated agents when incubated alone with cells and agents incorporated in matrix and incubated with cells indicated greater differentiation capability and lesser toxicity of cells. Use of such matrix is very important for delivery of compounds in a sustained fashion and also to tackle the diseased site in a multifunctional approach. Further studies on cardiomyogenic expression markers can establish the regenerative capability of such matrix

Keywords: Matrix; Sem cell differentiation; Biopolymer; Nanoparticles;Cardiac cells

AB-19

CORRELATION OF COMPLETE HEMOGRAM, IRON PROFILE & PH OF CORD BLOOD OF NEWBORN WITH APGAR SCORE AND GRAVID STATUS OF MOTHER – A PROSPECTIVE OBSERVATIONAL STUDY

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Abstract: APGAR score is a scoring system used to assess newborn health. It is assessed at 1 and 5 min from baby's birth. The gravidity indicates the number of times the woman has become pregnant. The combination of complete haemogram, iron profile, pH analysis and APGAR will help to detect the wellbeing of the neonate better than APGAR alone. The aim of the study was to correlate the complete hemogram (including all RBC indices, WBC and platelet parameters, Reticulocyte Count and Nucleated RBC count), pH and Iron profile of Newborn cord blood with APGAR score in primi and multigravida. This study was undertaken since a study encompassing all the prognostic markers on neonatal health has not been performed comparing APGAR scores at 1 and 5 minutes and gravidity of the mother. The cord blood of 40 newborns (20 primigravida and 20 multigravida) were collected in pre-heparinized syringe for pH, K2 EDTA vacutainer for hematological analysis and plain vacutainer for biochemical analysis. The blood was obtained right after deliver and clamping of the umbilical cord. APGAR scores were obtained from clinician's records. The results showed no significant correlation of primigravida and multigravida with APGAR score and all the complete haemogram parameters, reticulocyte count, nucleated RBCs, pH & Iron profile parameters. Correlation of the parameters comprised of complete hemogram count, pH, iron studies and APGAR score with the gravidity was also analyzed. The parameter MCHC showed some significant correlation (Negative correlation). While comparing between primigravida and multigravida, neutrophils are more in number in primigravida while lymphocytes are more in multigravida.

Keyword: APGAR Score, Haemogram, Iron Profile, pH, Newborn Health

AB-20

RENAL DYSPLASIA – AUTOPSY FINDINGS

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Abstract: Renal dysplasia is an abnormality of metanephric development along with structural abnormalities. The entity has also been attributed to have been caused by ciliary dysfunction. Certain genetic anomalies can have renal dysplasia as a part of its presentation, including atypical forms of autosomal dominant polycystic kidney syndrome, autosomal recessive polycystic kidney syndrome like syndrome and ciliopathies that involve multiple systems such as Joubert syndrome. Renal dysplasia in foetal autopsies are infrequently encountered. A developmental anomaly associated with the metanephric system has wide spread consequences that may prove to be fatal or at the least disabling. A precise prenatal diagnosis, with the help of radiological and genetic studies are important in cases with oligohydramnios, so as not to miss renal dysplasia or any associated genetic abnormalities, especially when there is a previous history of pregnancy loss. Such investigations can direct the autopsy being performed, whether special focus has to be given to certain organ systems or if samples have to be sent for genetic testing, as there is also a high degree of association with Down's syndrome, Meckel syndrome and many other syndromes. It also will aid in the counselling of the parents and proper management of current pregnancy. It will also aid to assess the risk that future pregnancies hold in terms of conceiving an anomalous foetus. Here we present a case of bilateral renal dysplasia in a 28-week-old foetus without any gross or histological anomalies of other systems or the remainder of the urinary system, with a history of severe oligohydramnios in the mother.

Keyword: Cystic Renal Dysplasia, Renal Anomalies, Foetal Autopsy, Congenital Anomaly, Oligohydramnios

AB-21

AYUSH MEDICINE'S POLYHERBAL EXTRACTS - A ROADMAP FOR ANTIVIRAL DRUG DISCOVERY

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Abstract: The prevalence of viral diseases like dengue, chikungunya, and novel coronavirus across the globe pushed the scientific community in search of new antiviral bioactive compounds from the medicinal herbs. Siddha medicine, a division of the AYUSH system of Medicine, is gaining importance in recent years due to its extensive therapeutic polyherbal preparations specific to viral infections. Among them, three potential polyherbal decoctions namely Nilavembu kudineer, Kaba sura kudineer, and Vatha sura kudineer serve as credible sources for the development of the modern novel antiviral drugs. Phytochemical screening of the Nilavembu kudineer showed several antiviral components like terpenoids, alkaloids, tannins, steroids, and phytoconstituents like bis-andrographolide, caffeic acid, vitexin, etc. Similarly, Kaba sura kudineer also contains several phytoconstituents like magnoflorine, tinosponone, cirsimaritin, chrysoeriol, vasicinone, quercetin and luteolin that were found to have antiviral properties. However, vatha sura kudineer has been used as antipyretic, anti-inflammatory, antiviral for centuries in traditional system medicine, but its antiviral properties are not well documented through evidence-based scientific literature. Even though all above-mentioned decoctions are found to be highly effective with a wide range of phytochemicals, their exact mechanism of action, signaling pathways, interactions and implications in the management of viral diseases are yet to be discovered. Considering the importance of ancient wisdom, these polyherbal decoctions have to undergo a routine clinical trial process and it has to be documented completely for their efficacy. Further, these medications are to be tested in drug resistance viral diseases as well as with mutant/new viral strains. In the current scenario, if the mentioned traditional medications show significant evidence based results, then it can be integrated with conventional medicine, so that it can provide an added benefit in the management of viral infections.

Keywords: Antiviral, Antipyretic, AYUSH Medicine, Kaba sura kudineer, Nilavembu kudineer and Vatha sura kudineer

AB-22

A REVIEW ON RNASE1 AS A NOVEL DIAGNOSTIC BIOMARKER FOR HEART FAILURE

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Abstract: Heart failure (HF) is the most common cause of morbidity and mortality worldwide. Approximately 40 million people, endure heart failure with the increase in disease burden along with both genetic and epigenetic factors. The pathophysiology of HF is characterized by a decrease in cardiac productivity, which leads to a reduction in Mean Arterial Pressure (MAP) that causes inadequate tissue perfusion. This abnormal mechanism of the body attempts to preserve adequate myocardial perfusion that compensates the Frank–Starling mechanism and left ventricular remodeling. Several studies have established the association of the traditional environmental and hereditary risk factors in the pathogenesis of heart failure. However, the mechanism of these associations remains largely unclear due to complexity of disease pathophysiology and lack of integrative approach that fail to provide a definite understanding of molecular linkage and an effective diagnostic biomarker for heart failure. This review discuss about the role of RNASE1, a member of the Ribonuclease family. Decreased levels of RNASE1 was noticed in the patients with heart failure. Additionally, experiment study in animal model showed RNASE1 treatment dramatically reduce myocardial infarction. Particularly, RNASE1 inhibit the extracellular RNA (eRNA) that play causative role in cardiovascular disease. Also, regimen with non-toxic RNASE1 shown benitift while acute ischaemia-reperfusion injury and reduce the size of myocardial infarct and thereby it preserve the left ventricular systolic function. Also, treatment with RNASE1 resulted in decreased cytokine release and normalize the antioxidant enzymes. Overall, RNASE1 noticed efficient in both diagnostic and therauptic end points in cardiovascular diseases induced in animal models. Further exploration RNASE1 in human may benefit to patients with heart failure.

Keywords: Ribonuclease, Mean arterial pressure, heart failure, Frank–Starling mechanism, left ventricular remodeling, clinical viability.

AB-23

A REVIEW ON EMERGING MULTI-OMICS BIOMARKERS FOR THE DIAGNOSIS OF ATHEROSCLEROSIS

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Abstract: Cardiovascular disease is the major cause of death around the globe. Genetics, environmental, and lifestyle factors significantly contributes to the impact on cardiovascular diseases, with atherosclerosis.Atherosclerosis is the etiopathological factor (ACVD), and early recognition that can significantly contribute to effective prevention and treatment for CVD. The possibility of detecting high-risk individuals long before they develop CVD is essential for primary prevention of this disease. This emphasizes the importance of precise risk classification and development of biomarkers. To predict cardiovascular events, a growing number of new biomarkers are being discovered. Biomarkers are important for defining, prognosticating, and making decisions about how to treat cardiovascular events. In cardiovascular events, immune related markers such as high-sensitivity C-reactive protein, cardiac troponin, brain natriuretic peptide, growth differentiation factor, myeloperoxidase, and matrix metalloproteinases are used to predict the myocardial ischemia, infarction and heart failure. Recent research studies on genetics and epigenetic factors involved in cardiovascular disease using multi-omics approach such as proteomics, genomics, epigenomics and transcriptomics has been a novel tool for diagnostics and therapeutic approaches. Several studies on novel biomarkers with molecular mechanism of CVD are developing, owing to the promise of multi-omics approaches as tools for identifying biomarkers with possible therapeutic relevance. Therefore, this review emphasis the emerging role of Vascular cell adhesion molecule (VCAM) in multi-omics approaches as a diagnostic biomarker in CVD future events. VCAM1 plays a dominant role in initiation of atherosclerosis. it is an adhesion molecule expressed in atherosclerotic lesions that correlate with change in serum metabolite and lipids . Therefore, VCAM1 is observed as a novel early diagnostic biomarker in developing lesions in patients with CVD. Overall, our review emphasize the contribution of VCAM1 in alter the serum metabolome and lipidome that may help in development of biomarkers for CVD.

Keywords: CVD, VCAM, 1 Myocardial Infarction, acute coronary syndrome, serum metabolome and lipidome

AB-24

RESPIRATORY DISEASE MANAGEMENT USING NANOMEDICINE: A REVIEW

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Abstract: Nano medicine deals with monitoring, repair and development of human biological system at the sub atomic level, where we make use of designed nano devices and nanostructures. The delivery of payloads to the targeted cells or organs can be facilitated by particular nanostructures which aids in sustained drug release, increases the circulation time and effectively utilizes the drug molecules before clearance from the system. The targeted drug delivery thus reduces the dosage of the drugs and their penetration power to the cells are also improved due to the usage of liposomes or other lipid based nanoparticles or charged nanopolymers that can fuse with the cell membrane to release the drug. Moreover, stimuli responsive drug delivery also facilitates the delivery of drugs based on the microenvironment of the organs or tissues. The respiratory diseases plays a major hindrance in patient management due to several limitations of drug delivery, effective incorporation of the drugs and associated side effects. The local delivery of therapeutic nanoparticles to the lung is rendered as an ideal technique for the treatment of various diseases of the respiratory tract, such as chronic obstructive pulmonary diseases, cystic fibrosis, lung cancer tuberculosis, asthma, and infection. To overcome the difficulties of conventional treatment with antibiotics and anti-inflammatory drugs, nano enabled drug delivery, nano formulations of drugs as well as drug nano encapsulation has been used recently. This review will discuss about the importance and application of nano medicine for diagnosis, treatment and clinical research involved in the different types of respiratory diseases.

Keywords: nanomedicine, asthma, chronic obstructive pulmonary diseases, cystic fibrosis, respiratory diseases.

AB-25

COMPARISON OF PLATELET RICH PLASMA VERSUS CORTICOSTEROID INJECTION IN MANAGEMENT OF LATERAL EPICONDYLITIS

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Abstract: Lateral epicondylitis is a chronic tendinosis of the common extensor muscles at their origin on the lateral humeral epicondyle particularly affecting the extensor carpi radialis brevis. Generally Lateral epicondylitis is treated with non steriodal anti inflammatory drugs. Along with that other therapies like shock wave therapy, physical therapy, splinting and surgery were also practised and none of them were reproted to be universally effective. Among all the stated methods, treatment using corticosteriod injection was found to be extensively due to its cost effectiveness. Though this is a simple technique, the short duration of action was observed as a drawback and hence other ortho biologics are being used as an alternative to this therapy. Platelet Rich Plasma therapy (PRP) is prepared from autologous blood and contains an increased concentration of autologous platelets. PRP contain growth factors that might be beneficial for the healing of soft tissue injuries. The purpose of this study was to compare the clinical and functional outcome in patients with lateral epicondylitis treated with platelet rich plasma versus corticosteroid injection. This randomised control trial study was performed on 36 patients, that was conducted between January 2020 - May 2021 which involved all patients attending OPD at Department of Orthopaedics, Chettinad hospital and research institute clinically diagnosed to have lateral epicondylitis. All the patients were selected for the study based on the inclusion and exclusion criteria and allotted to the respective groups using block randomisation. The patients were followed on the sixth week, third month and sixth month and at each visit PRTEE, DASH score for assessing the functional outcome and VAS score was assessed for pain. A single injection of autologous platelet rich plasma provided better long term reduction in pain and improvement in functional scores of elbow when compared to corticosteroid injection in the treatment of lateral epicondylitis.

Keywords: Lateral epicondylitis, corticosteroids, lasma therapy, VAS score, PRTEE score.