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I would like to thank my family, who supported and encouraged me in spite of all the time it took me away from them. This conference could see the light of day due to generous support from the WFST.

The readers and beneficiaries vary from academicians, professional engineers and scientists, to undergraduate and graduate students from all over the country.

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RFI/IC-PRI/120

MODERN ANALYTICAL TECHNIQUES

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Abstract- The spectroscopy techniques for the quantitative and qualitative estimation of drugs have been includes the various methods UV-Visible spectroscopy, Mass spectrometry, Infrared spectroscopy, Nuclear magnetic resonance, Fluorimetry, and phosphorimetry. Hyphenated techniques for the analysis of drugs follow the various techniques in combination with two of three methods i.e; LC-NMR, LC-MS, LC-IR, GC-MS, CE-MS, LC-PDAMS, LC-MS-MS, LC-NMR-MS, LCPDA-NMR-MS etc. It is very important to develop a method with minimum errors, and to overcome the faulted errors in analytical chemistry some of latest trends in analytical techniques were available which includes advancement in automated development of HPLC, RP-HPLC, LC-MS etc. These methods suggest the proper use of each technique in the better advancement of drug development process.

RFI/IC-PRI/122

EXTRACTION TECHNIQUES TO DERIVE MOSQUITOCIDAL PHYTOCHEMICALS FROM PLANTS

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Phytochemicals are biologically active compounds which are found in plants. They present in the various parts of the plant such as root, stem, flower, bark, fruit, peels etc. They also used as the ingredients in human nutrition and medical science. Phytochemicals classified into primary metabolites and secondary metabolites. The secondary metabolites involved in the plant defence mechanism. This property of secondary metabolites leads to the emergence of natural insecticides from plant origin. Large number of plant extracts has been reported to have mosquitocidal or repellent activity against mosquito vectors, but very few plant products have shown practical utility for mosquito control. This study reviews the extraction methods to derive the phytochemicals which has the potential to control mosquito vectors.

RFI/IC-PRI/124

STABILITY INDICATING RP-HPLC METHOD FOR THE DETERMINATION OF DAUNORUBICIN IN PHARMACEUTICAL FORMULATION

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Abstract - Stability indicating high performance liquid chromatography (HPLC) method was developed for the assay of daunorubicin in bulk and parenteral formulation. The HPLC separation was achieved on kromasil C18 (100mm × 4.6mm, 5 µm) column using a mobile phase of Acetonitrile+0.1% (OPA) Water (95+05%v/v) at a flow rate of 1 ml min^{-1} and UV detection at 230 nm. Peak elutes at 4.31 appropriate. The method was validated for linearity, repeatability, accuracy, precision, robustness, limit of detection and limit of quantification. The accuracy was between 99.34 - 99.87%. The highest R.S.D. amongst interday and intraday precision was found 0.908 and 0.456 respectively. The assay was linear over the concentration range of 10-50 µg/ml (R≈0.999). The method was robust as no significant change in chromatographic parameters. LOD and LOQ was found to be 0.94 and 2.71 respectively. The stress studies were performed per ICH guidelines to confirm its Stress testing was carried out in presence of acid, base, hydrogen peroxide, heat and light to demonstrate specificity of the method as per ICH guidelines. The developed method could separate the potential degradation products from the daunorubicin peak. It was concluded that highest degradation occurs in basic condition. This proposed method was suitable and practical for analysis the content of daunorubicin in pharmaceutical products and could be of benefit for the prediction shelf life of daunorubicin in marketed formulations.

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GREENER STRATEGIES AND GREENER THINKING FOR PHARMACEUTICALS SYNTHESIS

Dr. Priya Jain, Mr. Kuldeep Vinchurkar, Dr. Gurmeet Chhabra, Dr. Dinesh Kumar Mishra

Abstract- The basic principles of green chemistry addresses various issues related to synthesis of chemical compounds: planning organic synthesis to maximize yield, prevention/minimization of waste, atom economy, the use of less lethal chemicals, use of safer solvents, renewable starting materials, energy efficiency and use of green catalysts. The objective of this study is to elaborate the practical approaches of green chemistry in synthesis and its applications in pharmaceutical fields. In this paper, we elucidate some important common syntheses having green procedures which are being used in the synthesis of pharmaceutical compounds and other organic moieties.
Keywords: Green chemistry, Flow chemistry, Clean chemistry.

RFI/IC-PRI/126

HORMONES AND GENES INVOLVEMENT IN THE PATHOPHYSIOLOGY OF SCHIZOPHRENIA

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Abstract - Schizophrenia is a debilitating brain disorder with a worldwide prevalence of ~1% that results in substantial morbidity and mortality. The main symptoms of schizophrenia are hallucinations, delusions, and cognitive impairments. Most cases of schizophrenia start during adolescence and early adulthood, and often have a lifelong course.The serotonin 2A receptor (HTR2A) is particularly abundant in the mammalian cortex is important in controlling cortical and is responsive to changes in serotonergic activity. Dopamine D_1 receptors are expressed at high levels on the distal dendrites of pyramidal neurons in the prefrontal cortex that are thought to be involved in working memory processes**.** GWAS have identified the α-1C subunit of the L-type voltage-gated calcium channel (*CACNA1C*) gene as a significant risk gene for schizophrenia. Dysbindin-1 gene was found to be a component of the dystrophin-associated protein complex (DPC) in skeletal muscle cells. DPC is highly expressed in the brain, in particular the cortex and the hippocampus. Many studies have shown that dysbindin-1 is one of the important potential susceptibility gene for schizophrenia. Overall purpose of this study is to find the pathophysiology of Schizophrenia which pave ways to control the prevalence of schizophrenia more effectively and to diagnose schizophrenia at early stage by using the estimation of biogenic amines present in the blood.

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IN VITRO MUTAGENICITY OF GMELINA ARBOREA ROXB (GAMBHARI) EXTRACT BY AMES ASSAY

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Abstract - *Gmelina arborea* Roxb (family Verbenaceae) commonly known as 'Gambhari' tree, the various parts of the plants are widely used in diarrhoea, anti-pyretic, thirst, anemia, leprosy, ulcers, consumption, strangury, vaginal discharges. We tested the genotoxic potential of *G. arborea* in Gram-negative bacteria *Salmonella typhimurium TA98 (MTCC 1252*) and *Salmonella typhimurium TA100 (MTCC 1252*) were used for the Ames assay using number of revertants as the toxicological endpoints. Aqueous extract of *Gmelina arborea roxb* (AEGA) was tested at the various concentrations 5, 10, 15 and 20 mg.

The number of revertants significantly increased in strains TA98 and TA100 with and without S9 activation. The AEGA, when assessed with the strain TA98, displayed mutagenicity index (MI) between 1.2 to 2.2, without metabolic activation and between 1.2 to 2.1 with metabolic activation. With the strain TA100 the MI was between 1.1 to 1.5 without metabolic activation and between 1.04 to 1.1 with metabolic activation. The mutagenic indices were raised in strains TA98 and TA100 by metabolic activation. In this study, we investigated the effect of *G. arborea* on Gram-negative bacteria *Salmonella typhimurium* using number of revertants to assess the genotoxicity of the herb.
Keywords: Ames assay, Revertants, Genotoxicity.

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3D PRINTING FOR DRUG DELIVERY AND ITS PHARMACEUTICAL APPLICATION-A MINI REVIEW

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Abstract- 3D Printing technology also known as Additive Manufacturing is a rapid prototyping process which construct solid product with various geometrics by successive layers of material by the use of Computer Aided Design (CAD). The introduction of 3DP technology in the pharmaceutical industry has opened new horizons in research and development of printed material and devices. Recently FDA has approved a 3D printed tablet called Spritam, which brings tremendous boost in the preparation of fabricated drug delivery system and personalized medicine. This manuscript presents the current status of research and development in 3DP technology, background and basic procedure involved in 3DP. It also includes the main components and types of 3DP, different methods and polymers used, advantages, limitations and applications of 3D printing technology pharmaceutical field.

RFI/IC-PRI/132

LOADED MICROSPHERES BY SOLVENT EVAPORATION TECHNIQUE: *IN VITRO-IN VIVO* STUDY OF METFORMIN AS A MODEL DRUG

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Abstract- The present study has been performed to microencapsulate the antidiabetic drug of Metformin to get sustained release of drug. The attempt of this study was to formulate and evaluate the repaglinide loaded microspheres by emulsion solvent evaporation technique using different polymers like Eudragit L100, Eudragit S100, Eudragit RSPO and Ethyl cellulose. *In vitro* dissolution studies were carried out in 0.1 N HCl for 8 hours according to USP paddle method. The maximum and minimum drug release were observed as 94.6% and 78.4% from microspheres, respectively, after 12 hours. Release kinetics were studied in different mathematical release models to find out the linear relationship and release rate of drug. The SEM, DSC, and FTIR studies have been done to confirm good spheres and smooth surface as well as interaction along with drug and polymer. In this experiment, it is difficult to explain the exact mechanism of drug release. But the drug might be released by both diffusion and erosion as the correlation coefficient (R^2) best fitted with Korsmeyer model and release exponent (η) was 0.42–0.88. At last it can be concluded that all *in vitro* and *in vivo* experiments exhibited promising result to treat type II diabetes mellitus with metformin microspheres.

RFI/IC-PRI/133

FORMULATION AND DEVELOPMENT OF AQUASOMES AS SELF-ASSEMBLED NANO-STRUCTURE DRUG CARRIER SYSTEM

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Abstract - This is the first report of its kind representing **Aquasomes (AQ)** as an efficient dual drug delivery system, capable of releasing bioactive molecule and a hydrophobic drug together. AQ are self-assembled **nanostructures**, made up of a spherical hydroxyapatite core and a carbohydrate layer on top, for delivering bioactive molecules like proteins, peptides, etc., which are adsorbed on the carbohydrate layer. The formulated AQ before and after adsorption of the bioactive molecule are characterized using dynamic light scattering, scanning electron microscopy, X-ray diffraction, small-angle X-ray scattering, fourier transform infrared spectroscopy, thermo gravimetric analysis and differential scanning calorimetry. Protein is used as the model bioactive agent for the in vitro dual release studies along with representative hydrophobic drugs Coumarin, Warfarin (WAR), and Ibuprofen (IBU). Further, the release behaviors of the hydrophobic drugs are elucidated by studying their binding interactions with bioactive agent. The use of new, innovative dual drug delivery systems (DDDS) has attracted large attention in recent years for providing a better human health care and effective therapeutic treatment.
Keywords: Nanotechnology, Aquasomes, Warfarin and Hydroxyapatite.

RFI/IC-PRI/135

FORMULATION AND EVALUATION OF CALCIUM WITH VITAMIN D3 CHEWABLE TABLET AS ORAL DRUG DELIVERY SYSTEM

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Abstract - Calcium and Vitamin combinations are used to prevent low calcium levels in the body or treat these low levels of calcium in peoples who do not get necessary amount of calcium from their daily routine diets. It may be used to treat conditions which occur due to low calcium levels for conditions such as osteoporosis, osteomalacia, and hyperparathyroidism, and certain muscle diseases. Whenever there is a lack of calcium in the blood, the body will cover the calcium blood levels by taking the same from bones which in turn causes weakening of bones. Vitamin D addition in calcium formulation helps body for absorbing available calcium and phosphorus. Strong bones can be built and further maintained by correct and requisites amount of vitamin D, calcium, and phosphorus. Chewable tablets are solid dosage forms containing medicinal substances which are intended to be chewed, producing a pleasant tasting residue in the oral cavity which can be easily swallowed and does not leave a bitter or unpleasant after taste. Different Formulations for Calcium with Vitamin D3 were developed using different strategies of manufacturing process. Trials were taken using different concentrations of binders and to optimize the binder concentration which will give desired hardness and further acceptable physical parameters. Trial Batch The scale up batch was taken similar to Batch B1 and the same was subjected to stability studies. The stability analysis was performed for accelerated conditions of temperature and humidity and also at real time conditions. The final formulation was also compared with market samples for Mouth feel, Chew ability Index and other physical aspects. This Final formulation was found to be more appealing with respect to taste, mouth feel and chew ability index and was found satisfactory with respect to simplified manufacturing process which will have impact on cost.

RFI/IC-PRI/136

NANOCARRIERS FOR TREATMENT AND MANAGEMENT OF ANTIFUNGAL ACTIVITY

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Abstract- A fungus infection is the most common global skin health issue. They are usually treated with topical or systemic antifungal therapy. Topical therapy is usually preferred due to its targeted therapy and less side effects. Due to their unique structural and functional characteristics, advanced topical carriers overcome many biopharmaceutical challenges associated with conventional drug delivery systems like poor retention and low bioavailability. Evidence from literature suggests topical antifungal nanocarriers with anti-fungal agents provide superior results with minimal side effects. Different types of nanocarriers are widely used for topical antifungal medication, including Solid-Lipid nanoparticles, Micro emulsions, Liposomes, Niosomes, Micro sponge, Nanogel, Nanoemulsion, Micelles etc. In this article we summarize recent advances in topical carriers that are employed to promote the therapeutic effectiveness of anti-fungal drugs.

Keywords: Nanocarriers, Antifungal, Nano particles, Nanomaterials, Infectious disease, Pharmaceutical science.

RFI/IC-PRI/141

DESIGN OF MICROEMULSION LOADED GEL OF TERBINAFINE

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Abstract - Micro emulsions as drug delivery system are widely used due to there capacity to solubilize poorly water-soluble drugs efficiently. Terbinafine is mainstay of oral antifungal armamentarium and it is also used in topical formulations. Currently, formulations containing the free base and salt form are available. However, due to its poor water solubility and physicochemical properties its uptake by the skin is limited and hence new formulation approaches are continuously being done. The present investigation is an attempt to design micro emulsion loaded gel of terbinafine hydrochloride. The prepared micro emulsion was evaluated for globule size, zeta potential and pH. The gel was evaluated by visual characterization, drug content, in vitro drug release, and stability. The emulsion was formulated using an Smix obtained from phase diagram study. F1-F9 different formulations were prepared with varying percentage of oil, water and surfactants. Out of this F 6 formulation had 92.23 ± 0.3% drug loading and a pH of 6.2 ± 0.2. The zeta potential of this formulation was -35.21. Hence, this was used for gel preparation using Carbopol 934. Three formulations were tested out of which one with pH 6.5 ± 0.05, spreadability 21.7 ± 0.05, viscosity 6752 ± 27 and drug content 99.28 ± 0.02 was considered as the best formulation. The stability study revealed negligible changes in the drug content of selected formulation. The results confirm that microemulgel formulation of terbinafine can be used as a good alternative for topical use in antifungal armamentarium.

Keywords: Antifungal, Microemulgel, Surfactant, Carbopol 934.

RFI/IC-PRI/143

DESIGN, DEVELOPMENT AND EVALUATION OF FEBUXOSTAT LOADED TRANSDERMAL PATCH FOR GOUT THERAPY

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Abstract- The objective of the present study is todesign an efficient transdermal drug delivery system to deliver Febuxostat transversally. Thereby enhancing drug bioavailability by preventing hepatic first pass metabolism. Transdermal patches of Febuxostat were formulated by solvent casting method. Prepared formulations were evaluated for various

parameters like % moisture uptake, tensile strength, % moisture content, thickness, % drug content, % elongation, folding endurance, in-vitro drug release. In a total of three batches of formulations from TD1 to TD 3 were prepared by varying concentration of polymers. All the batches were successfully prepared and evaluated. However, results of parameter evaluated conclude that among all prepared formulations, TD3containing combination of Eudragit L-100 and HPMC in ratio (1:1) was observed as the most optimized formulation in terms of in vitro drug release (24hrs) and other evaluation parameters. The drug release of optimized batch was sustained enough to prolong the therapeutic action. The adverse effects observed after oral administration of drug due to peak and valley plasma concentration drug profile can be overcome by transdermal febuxostat delivery. As plasma drug concentration is maintained in a constant range for a long time.

Keywords: Febuxostat, Transdermal Patch, Gout, Transdermal drug delivery, Sustained drug delivery.

RFI/IC-PRI/144

DESIGN OF TOPICAL GEL LOADED WITH NANOEMULSION OF CICLOCLOPIROX OLAMINE

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Abstract - It is observed that now-a-days there is a rapid increase in the prevalence of fungal infections in the population owing to the increased use of oral steroids. In addition, there is also a proportional increase in the resistance development to existing gold standard the rapies. Ciclopirox olamine, a drug available since 1970s but not widely used in clinics due to its limited efficacy. However, post-Covid-19 there is a renewed interest in this agent owing to its pleotropic action. The present investigation is an attempt to design and develop a nanoemulsion of Ciclopirox olamine and its incorporation in Gel. Nanoemulsion was prepared by using a blend of Capmul PG8, Cremaphor EL and Transcutol P using Phase diagram assay and applying factorial design concept. The nanosizing was confirmed via zeta potential measurements. Carbopol was used as a gelling agent. The gel was evaluated for viscosity, spreadability, drug content and in vitro diffusion study. Stability studies were performed up to 2 months. Results revealed the formation of nanoemulsion as indicated by the zeta potential value of -39.4 mV. The drug content of the gel was found to be 98.85 ± 0.4 %, pH – 6.8 ± 0.1, viscosity of 3560 ± 35 cps in the optimized formulation. It was also found to be stable for two months. In conclusion, nano-formulation approach may prove fruitful for topical anti-fungal preparations containing Ciclopirox Olamine.

Keywords: Antifungal, Carbopol, Cremaphor, Transcutol.

RFI/IC-PRI/145

SYNTHESIS AND IMPORTANCE OF PYRIDINE DERIVATIVES

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Abstract -Pyridine has the chemical formula C5H5N and is a basic heterocyclic organic molecule. It has a similar structure to benzene, but one of the methine groups (=CH) has been substituted by a nitrogen atom. Substituted pyridines are an important class of compounds in organic synthesis. Pyridines are frequently used as intermediates in the production of bioactive goods such as medicinal, herbicides, insecticides, and fungicides. End items that are important for these market applications have been identified. Pyridine derivatives have a variety of biological properties, with a number of the drugs being used in clinical studies. Pyridine derivatives are becoming important in the modern medicine. Most chemical properties of pyridine are typical of a hetero aromatic compound. In organic reactions, pyridine behaves both as a tertiary amine, undergoing protonation, alkylation, acylation, and N-oxidation at the nitrogen atom, and as an aromatic compound, undergoing

nucleophilic substitutions. Because of the electronegative nitrogen in the pyridine ring. The structural framework of substituted pyridines is often seen in natural products, compounds possessing important biological activities.

Heterocyclic compounds, especially nitrogen heterocycles represent an important class of compounds having a unique identity in the field of pharmaceutical research and drug discovery. In daily life, trace amounts of pyridine are components of the volatile organic compounds that are produced in roasting and preservative process ex: in fried chicken, roasted coffee, potato chips and fried pork .We believe that pyridine derivatives can be used as promising medicinal properties and more broad investigations in this field need to be performed.

RFI/IC-PRI/146

NETWORK PHARMACOLOGY, GENE ONTOLOGY, GENE ENRICHMENT AND PHARMACOKINETICS ANALYSIS OF BETA AMYRIN A PHYTOCONSTITUENT OF COUROUPITA GUIANENSIS

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Abstract- Couroupita guianensis belongs to family Lecythidaceae and was commonly described as cannon ball tree that has highly medicinal valued due to its therapeutic benefits. The present study set out to investigate the activity potential of Beta Amyr in a phytoconstituent of canon ball tree against the genes clusters of Homo sapiens. The Analysis suggested the activity of this phytoconstituents in the different pathway of disease. For the accomplishment of this objective, Network pharmacology approach, gene ontology, pharmacokinetics analysis, studies were performed. The gene targets were identified from different databases. The network analysis showed that the top ten targets which were vitally significant target related to Beta Amyrin. On the basis of gene ontology and topology analysis and network analysis a Pathways were found which was more significant.
Keywords: Beta amyrin, network pharmacology, Pharmacokinetic, gene ontology, Gene enrichment.

RFI/IC-PRI/148

FORMULATION AND EVALUATION OF NARASIMHA CHURNA FOR AMYLOLYTIC ACTIVITY

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Abstract- Ayurvedic medicines play an important role in immune problems due to safety and efficacy in it. Hence Narsimha Churna meant for amylolytic activity has been formulated by standard procedures and evaluated by physical and analytical methods. The formulation consists of fine powder (sieve 60 size) of dried roots of Asparagus racemosus, fruits of Tribulus terrestris, rhizome of Dioscorea bulbifera, steam of Tinospora cordifolia and fruit of Semecarpus anacardium in appropriate proportions (2:2:1:1) and mixed well. Physical parameters viz, total ash, acid insoluble ash, water extractive values, alcohol soluble extractive values and crude fibre content besides heavy metal analysis were carried out. The microbial load of formulation for Escherichia coli was also determined. The efficiency of churna for finds the amylolytic activity.

Ash values and extractive values were found to be within prescribed limits. The arsenic level was found to be 0.205 ppm. Churna did not show the presence of any Escherichia coli and other microorganisms. The churna showed pronounced amylolytic activity.
Keywords: Ayurvedic Medicines, Digestion, Complementary Therapies, Amylolytic Activity.

RFI/IC-PRI/149

AYURVEDA IN CANCER MANAGEMENT: A POSITIVE APPROACH

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Abstract - An ancient medical system summarizing the Hindu art of healing and prolonging life. Various herbal constituents have been found worldwide to confirm their use as anticancer therapy. But an integrated approach is required along with complete knowledge about the disease. In as much as, an effort has been made in that review article to discuss the role of Ayurvedsim in cancer Management. The reported articles on cancer management of plant origin claimed the treatment of one of the most silent killer diseases, i.e. cancer.
Keywords: Ayurvedism, Cancer, Therapy.

RFI/IC-PRI/150

A STUDY ON SYNTHESIS OF PERIPHERAL ARTERIAL DISEASE ACTIVITY OF PENTOXYFYLLINE AND THEIR DERIVATIVE

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Abstract - Systemic atherosclerosis is the most prevalent cause of peripheral arterial disease (PAD), in which the lower limbs' artery lumen is gradually obstructed by atherosclerotic plaque. It is estimated that patients with peripheral artery disease (PAD) have a three-fold greater risk of death from all causes and a six-fold greater risk of death from coronary heart disease than those who do not have the illness. A thorough history and physical examination are critical in the diagnosis of PAD, although they are constrained by a lack of consistent sensitivity and specificity. It is possible to confirm the diagnosis with non-invasive office-based testing like the ankle-brachial index. Disease severity and functional symptoms are closely correlated with the ankle-brachial index; it also serves as a tool for monitoring disease development as well as making predictions about cardiovascular and cerebrovascular mortality. Medical care of PAD is based on risk factor reduction, symptom alleviation, and antiplatelet therapy for secondary prevention.
Pentoxifylline is an anti-inflammatory methyl-xanthine derivative. Dermatological as well as non-dermatological disorders have been proven to benefit from pentoxifylline. A safe and cost-effective alternative medicine, it has been used both as a main drug and as an adjuvant. There are several essential elements of pentoxifylline that are covered in this article. Pentoxifylline's ability to improve the ability of people with Fontaine stage II intermittent claudication to walk was studied. Both authors independently reviewed the included papers, compared data, and addressed differences via conversation. Using the Cochrane 'Risk of bias' tool, reviewers evaluated the methodological quality of studies and gathered data on pain-free walking distance (PFWD) and total walking distance (TWD). The length and dosage of pentoxifylline were used to compare trials.
Key Words: Peripheral, Pentoxifylline, Dosage, Elements, Drug, Methodological, Derivative, Diagnosis, dermatological, Arterial

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A STUDY OF DOPAMINE MODULATION IN APIS MELLIFERA VIA ANTENNAL-LOBE NEURONS

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Abstract - Primary olfactory centers [antennal lobes (ALs)] of the honey bee brain are invaded by dopamine (DA)-immunoreactive neurons early in development (pupal stage 3),

immediately before a period of rapid growth and compartmentalization of the AL neuropil. During metamorphosis, the central nervous system of the honey bee, Apis mellifera, undergoes dramatic growth and reorganization. Nowhere are the changes more striking than in the primary olfactory centers (antennal lobes, ALs) of the brain. Around pupal stage 2 of the 9 stages of metamorphic adult development, antennal sensory afferent neurons enter the ALs. DA (dopamine hydrochloride, Sigma) was prepared in AIS immediately before use and pressure-ejected across the cell soma using a Picospritzer II (General Valve, Fairfield, NJ). DA was used at concentrations of between 5 and 50 × 10−5 M (pipette concentration). At these concentrations, effects of DA on DA-sensitive cells were immediately obvious, and the chances of observing at least some recovery during DA washout were maximized. DA was applied in 20-ms pulses delivered immediately before each depolarizing voltage step. Continuous superfusion of the recording chamber with fresh AIS prevented the localized accumulation of DA around cells between individual voltage steps. The delivery pipette was removed from the recording chamber, and the cells were superfused with DA-free AIS to facilitate recovery from any DA effect. As a result of Ca2+ current rundown in the cells, total outward current amplitudes decreased progressively over time. For this reason, effects of DA were examined over a 10-min recording period and compared with time-dependent changes in current amplitudes occurring in control (untreated) cells. Here we examine the modulatory actions of DA on honey bee AL neurons during this period. Voltage-clamp recordings in whole cell configuration were used to determine the effects of DA on ionic currents in AL neurons in vitro from pupal bees at stages 4-6 of the nine stages of metamorphic adult development. In approximately 45% of the neurons tested, DA (5-50 x 10(-5) M) reduced the amplitude of outward currents in the cells. In addition to a slowly activating, sustained outward current, DA reduced the amplitude of a rapidly activating, transient outward conductance in some cells. Both of the currents modulated by DA could be abolished by the removal of Ca2+ from the external medium or by treatment of cells with charybdotoxin (2 x 10(-8) M), a blocker of Ca2+-dependent K+ currents in the cells. Ca2+ currents were not affected by DA, nor were A-type K+ currents (I(A)). Results suggest that the delayed rectifier-like current (I(KV)) also remains intact in the presence of DA. Taken together, our data indicate that Ca2+-dependent K+ currents are targets of DA modulation in honey bee AL neurons. This study lends support to the hypothesis that DA plays a role in the developing brain of the bee.

Keywords: Antennal Lobes, Honeybee Brain,Dopamine Hydrochlorideand Neural Mechanisms

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GREEN SYNTHESIS OF BIOSYNTHESIS OF NANOPARTICLES FOR THEIR CATALYTIC APPLICATIONS USING MICROBIAL ENTITIES

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Abstract- Biosynthesis of nanoparticles to expand their uses and importance in the biological applications for the development of eco-friendly technologies in material science by using different microorganisms. This paper carries the highlights on recent trends for developments of inorganic nanoparticles, also including oxide nanoparticles, metallic nanoparticles, sulphide nanoparticles for their wide spectrum in potential areas which includes gene therapy, DNA analysis, biosensors, separation science, MRI (magnetic resonance imaging), antibacterial gents, cancer therapy, targeted drug delivery also as a catalysts in environmental remediation showing its high catalytic efficiency as these nanomaterials have ability to enhanced biocompatibility, stability and large specific surface areas. Nanobiotechnology processes have a potential to boost their production as they are not having any harsh, toxic and chemicals involvement and providing the overview of recent trends over conventional method via biological entities and their future potential applications as they have environmental friendly green chemistry based techniques.
Keywords: Green chemistry, Biological synthesis, Nanoparticles, catalytic applications.

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MODERN ANALYTICAL TECHNIQUES

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Abstract- The spectroscopy techniques for the quantitative and qualitative estimation of drugs have been includes the various methods UV-Visible spectroscopy, Mass spectrometry, Infrared spectroscopy, Nuclear magnetic resonance, Fluorimetry, and phosphorimetry. Hyphenated techniques for the analysis of drugs follow the various techniques in combination with two of three methods i.e; LC-NMR, LC-MS, LC-IR, GC-MS, CE-MS, LC-PDAMS, LC-MS-MS, LC-NMR-MS, LCPDA-NMR-MS etc. It is very important to develop a method with minimum errors, and to overcome the faulted errors in analytical chemistry some of latest trends in analytical techniques were available which includes advancement in automated development of HPLC, RP-HPLC, LC-MS etc. These methods suggest the proper use of each technique in the better advancement of drug development process.

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CICLOPIROX: NEW VISTAS FOR AN OLD ANTIFUNGAL AGENT

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Abstract - Irrational use of antifungal drugs along with corticosteroids has led to rampant emergence of resistant fungi; making its treatment highly complicated. Mucormycosis as post-treatment outcome of Covid-19 is the most recent noteworthy event. Ciclopirox olamine is an old, off-patent, efficacious, and safe topical antifungal of the hydroxypyridone family. Clinical trials with ciclopirox are ongoing with emphasis on its role in treatment of Taenia, Oncomycoses, and female reproductive tract cancers. Clinically, its use is well-established in the form of cream, nail lacquer, shampoos etc. with good safety profile. Erythema, irritation, redness, pain or pruritus, are documented following skin and vaginal application.

Over the years, in addition to the role of ciclopirox in killing dermatophytes, yeasts and molds, investigators have reported its beneficial effects as anti-ischemic stroke agent. It is found to alleviate brain infarction, neurological deficits and brain edema after ischemia. In addition, it is reported to be antidiabetic via modulation of ER stress and p21 activity. It may be used to treat porphyria by modulation of heme group biosynthesis. Moreover, anti-neoplastic activity against hematologic and solid tumors is noteworthy and reportedly occurs via inhibition of multiple signaling pathways like PERK, HMG-A2, DJ-1 mediated autophagy, cdc25A, mTOR, β-Catenin-c-Myc. However, contrary to its pleiotropic actions, it remains under-utilized in clinics. Hence, the aim of this review is to give a bird's eye view of the antifungal profile of the agent and provide an in-depth information of the new vistas that are emerging in latest research along with the obstacles preventing its use.

Keywords: Candida; ciclopirox olamine; dermatophyte; mycoses; pityriasis versicolor; seborrheic dermatitis; tinea; cancer.

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NANOCARRIERS FOR TREATMENT AND MANAGEMENT OF ANTIFUNGAL ACTIVITY

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Abstract - A fungus infection is the most common global skin health issue. They are usually treated with topical or systemic antifungal therapy. Topical therapy is usually preferred due to its targeted therapy and less side effects. Due to their unique structural and functional characteristics, advanced topical carriers overcome many biopharmaceutical

challenges associated with conventional drug delivery systems like poor retention and low bioavailability.Evidence from literature suggests topical antifungal nanocarriers with anti-fungal agents provide superior results with minimal side effects. Different types of nanocarriers are widely used for topical antifungal medication, including Solid-Lipid nanoparticles, Microemulsions, Liposomes, Niosomes, Microsponge, Nanogel, Nanoemulsion, Micelles etc.In this article we summarize recent advances in topical carriers that are employed to promote the therapeutic effectiveness of anti-fungal drugs.

Keywords: Nanocarriers, Antifungal, Nano particles, Nanomaterials, Infectious disease, Pharmaceutical science.

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IN VITRO MUTAGENICITY OF GMELINA ARBOREA ROXB (GAMBHARI) EXTRACT BY AMES ASSAY

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Abstract - Gmelina arborea Roxb (family Verbenaceae) commonly known as 'Gambhari' tree, the various parts of the plants are widely used in diarrhoea, anti-pyretic, thirst, anemia, leprosy, ulcers, consumption, strangury, vaginal discharges. We tested the genotoxic potential of G. arborea in Gram-negative bacteria Salmonella typhimurium TA98 (MTCC 1252) and Salmonella typhimurium TA100 (MTCC 1252) were used for the Ames assay using number of revertants as the toxicological endpoints. Aqueous extract of Gmelina arborea roxb (AEGA) was tested at the various concentrations 5, 10, 15 and 20 mg. The number of revertants significantly increased in strains TA98 and TA100 with and without S9 activation. The AEGA, when assessed with the strain TA98, displayed mutagenicity index (MI) between 1.2 to 2.2, without metabolic activation and between 1.2 to 2.1 with metabolic activation. With the strain TA100 the MI was between 1.1 to 1.5 without metabolic activation and between 1.04 to 1.1 with metabolic activation. The mutagenic indices were raised in strains TA98 and TA100 by metabolic activation. In this study, we investigated the effect of G. arborea on Gram-negative bacteria Salmonella typhimurium using number of revertants to assess the genotoxicity of the herb.

Keywords: Ames assay, Revertants, Genotoxicity.

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PROTEOLYSIS TARGETING CHIMERA- AN EMANATING PROTEIN DEGRADATION TECHNOLOGY

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Abstract - Proteolysis-targeting chimera (PROTAC) has been emerging technology for targeted protein degradation. PROTAC is a heterobifunctional molecule comprised of ligand-mostly a small molecule inhibitor of the targeted protein linked to another ligand of E3 ligase via flexible linkers. It promotes the degradation of Protein of Interest (POI) by forming a Ternary complex with E3 ligase. E3 ubiquitin ligase induces the ubiquitination of POI which is further degraded by endogenous 26s proteasomes known as a ubiquitin-proteasome system (UPS) which helps in the degradation of misfolded/unused proteins. PROTAC regulates the protein function via degrading protein instead of inhibiting them, developing sensitivity to drug-resistant targets and the possibility of affecting non-enzymatic functions. PRTOACs have been extensively studied all over the world and have been shown to outperform not only in cancer but also in immunological disorders, viral infections, and neurological diseases. Here review discusses different POI recruiting different E3 ligases connected with help of different units of the linker and also highlights what all PROTAC molecules have been established by different pharmaceuticals as well as biotechnological industries.

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FORMULATION AND EVALUATION OF MICROEMULSION LOADED GEL OF ANTIFUNGAL DRUG

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Abstract - Microemulsions as drug delivery system are widely used due to their capacity to solubilize poorly water-soluble drugs efficiently. Terbinafine is mainstay of oral antifungal armamentarium and it is also used in topical formulations. Currently, formulations containing the free base and salt form are available. However, due to its poor water solubility and physicochemical properties its uptake by the skin is limited and hence new formulation approaches are continuously being done. The present investigation is an attempt to design microemulsion loaded gel of terbinafine hydrochloride. The prepared microemulsion was evaluated for globule size, zeta potential and pH. The gel was evaluated by visual characterization, drug content, in vitro drug release, and stability. The emulsion was formulated using an Smix obtained from phase diagram study. F1-F9 different formulations were prepared with varying percentage of oil, water and surfactants. Out of this F 6 formulation had 92.23 ± 0.3% drug loading and a pH of 6.2 ± 0.2. The zeta potential of this formulation was -35.21. Hence, this was used for gel preparation using Carbopol 934. Three formulations were tested out of which one with pH 6.5 ± 0.05, spreadability 21.7 ± 0.05, viscosity 6752 ± 27 and drug content 99.28 ± 0.02 was considered as the best formulation. The stability study revealed negligible changes in the drug content of selected formulation. The results confirm that microemulgel formulation of terbinafine can be used as a good alternative for topical use in antifungal armamentarium.

Keywords: Antifungal, Microemulgel, Surfactant, Carbopol 934.

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A REVIEW ON: INTRODUCTION TO OBESITY

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Introduction - Obesity is an abnormal growth of adipose tissue due to an enlargement of fat cell size i.e. hypertrophic obesity or increase in number of fat cells i.e. hyperplastic obesity or may be the combination of both conditions. Obesity is considered as a disease that has become world epidemic condition. As per the data of World Health Organization for year 2016, 1.9 billion adults of age 18 years and above (39%) were listed as overweight with body mass index (BMI) 25-29.9 kg/m2 and 650 million (13%) were listed as obese with BMI >30 kg/m2. More than 340 million children of age 5 to 19 years are overweight or obese. In the United States near about 100 million adults of age 18 years and above (37%) and 12.7 million children of age between 5 to 18 years (17%) are obese. Every state of United States has a greater than 20% prevalence rate of obesity with 22 states exceeding 30%. In India, prevalence of overweight and obesity is increasing way more faster than the world average. The prevalence of overweight in women increased from 8.4% to 15.5% between 1998 and 2015 and in men increased from 2.2% to 5.1% over the same period of time.

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FORMULATION DEVELOPMENT & EVALUATION OF FLOATING DELIVERY SYSTEM CONTAINING CINNARIZINE

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Abstract - The main objective of the present study is to formulate and characterize floating cinnarizine loaded microsphere. To increase the residence time in the stomach thus result the drug release in sustained manner and might be improving bioavailability of floating microsphere. Floating microsphere of cinnarizine was successfully prepared by solvent evaporation method and evaluated for various parameters such as, % yield, % drug entrapment, floating behavior (% buoyancy) & floating lag time. Formulated floating microsphere was found release the drug in sustained behavior continuously for a prolonged

period of time for 12 hrs. Thus, the formulated cinnarizine floating microspheres can exhibit to be potential applicant for safe and effective delivery of drug in sustained manner.
Keywords: Floating delivery, Floating microsphere, Gastroretentive drug delivery system, Sustained release, Cinnarizine loaded microsphere.

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DESIGN OF NANOPARTICULATE SYSTEM FOR THE TOPICAL DELIVERY OF CICLOPIROX OLAMINE

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Introduction- Fungal infections are a universal problem and are routinely associated with high morbidity and mortality rates in immune-compromised individuals. An estimated 1.7 billion individuals suffer from fungal infections worldwide (Mota Fernandes et al., 2021). Fungal infections that are pathologically relevant can be categorized into two main types; Superficial fungal infections that affect the skin, mucous membranes, and keratinous tissues, causing ailments such as thrush, oropharyngeal candidiasis, and dermatophyte infections; and invasive fungal infections that are more life-threatening and affect sterile areas of the body such as the bloodstream, organs (lungs, liver, and kidneys), and the central nervous system(Mota Fernandes et al., 2021) Fungal infections can affect immune-competent and immune-compromised individuals equally. Critically ill COVID-19 patients in intensive care units (ICU) or on mechanical ventilation are more prone to bacterial or fungal nosocomial infections, which has caused marked increase in the cases of invasive fungal infections like mucormycosis, candidiasis, and aspergillosis. It is pivotal to understand Candida species like C. albicans, C. glabrata, C.tropicalis, and C.krusei are normal commensals inhabiting mucosal surfaces like skin, respiratory, urinary, or digestive tracts in humans. The patients who are immune compromised or on long-term pharmacotherapy have a tendency to develop mucosal candidiasis. Oropharyngeal candidiasis (OPC) caused predominantly by colonization of C. albicans can be a cause of morbidity in these patients. Mortality rate attributed to invasive candidiasis is 19–40%, which can increase to around 70% for ICU patients. Mucormycosis is a rare fungal disease with rhinoorbital-cerebral involvement being the most common type caused by inhalation of spores into paranasal sinus of susceptible individuals. Fatality rate of this fungal infection is 46% occurring due to vascular thrombosis, angioinvasion, and tissue necrosis (Jain and Taneja, 2021). Aspergillosis is another fungal disease invading the sinuses of immune compromised patients, caused by species Aspergillus fumigatus. The multitudinous increase of these fungal infections in COVID-19 patients in the past 1 year has been a cause of concern. The hosts at substantial risk of developing these fungal infections could be diabetics, immunocompromised individuals, patients on corticosteroids, and those with hematologic insufficiencies(Jain and Taneja, 2021).

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IN WHAT WAY E-LEARNING IS RENOVATING THE TEACHING SEGMENT?

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Introduction - E-learning refers to any type of learning or teaching that is aided by technology. Whether networked or not, information and communication technologies serve as distinct means for carrying out the learning process. Even as technology advancements in terms of devices and curriculum continue, the phrase will very certainly be applied to both out-of-classroom and in- classroom electronic educational experiences. The use of a computer and a network to communicate skills and knowledge is known as e-learning. Web-based learning, computer-based learning, virtual classroom chances, and digital collaboration are all examples of e-learning applications and methodologies. The Internet,

intranet/extranet, audio or video cassette, satellite television, and CDROM are all used to provide content. It can be self-paced or instructor-led and incorporates text, image, animation, streaming video, and audio, among other things. CBT (Computer-Based Training), IBT (Internet-Based Training), and WBT (Web-Based Training) are abbreviations for e-learning (Web-Based Training). This terminology, as well as versions such as e-learning, E-learning, and e-Learning, are still in use today. The terminologies will be used throughout this essay to demonstrate their applicability in the context of eLearning terminology. Electronic learning(e-learning) education methods have been made possible thanks to the Internet.

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PHYTOCHEMICAL AND PHARMACOLOGICAL ASPECTS OF SARCOSTEMMA ACIDUM

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Abstract - Natural products had been used by many cultures and traditions from thousands of years for their bioactive pharmacophores by modern pharmaceutical companies. The potential bioactive phytocompounds such as alkaloids, flavonoids, phenolic compounds, and steroids are potential source for drug discovery. The present review deals with chemical compounds, medicinal properties, biological activities, and pharmacological effects of Sarcostemma acidum. The plant species S. acidum is a member of the Asclepiadaceae family, locally known as Khair, Khimp, Khurasni tanto, Art thor, Soma, and Somavalli. In English, Moon plant and Moon creeper, and in Hindi, Somlata used in the Indian traditional system of medicine. This review focused on different properties of S. acidum Roxb. Voigt a multifaceted plant

Keywords: Sarcostemma acidum, Pharmacological uses, Phytochemical.

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QUANTITATIVE ESTIMATION OF MEGLITINIDE IN PHARMACEUTICAL DOSAGE FORMS BY UV VISIBLE SPECTROPHOTOMETRY

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Abstract - A literal and specific Visible spectrophotometric method was raised for the estimation for Repaglinide in solid pharmaceutical dosage form. The λ-max of Repaglinide was found to be 243nm to both crude and marketed sample and is analysed using Beer-Lamberts law. Beer's law was obeyed at the concentrations ranging 2-10µg/ml. The developed methods were absolute, definite, explicit and consistent and found to be ap roto type for routine determination for Repaglinide. The method was validated statistically and by recovery studies. The LOD (limit of detection) and LOQ (limit of quantification) for visible spectra were found to be 0.82µg/ml and1.011µg/ml. The correlation coefficient value was found to be 1.

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ISOTHERMAL ANALYSIS OF IMPURITY REMOVAL PROCESS BY MODIFIED MULTI-WALLED CARBON NANOTUBES

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Abstract- A great challenge for this century lies in cleaning-up the waste generated during industrial, domestic and agricultural activities. Water, as vital part of the life cycle is heavily affected by these activities and eventually, turns it unusable. Among the numerous contaminants found in water, heavy metals require special attention, as they are non-biodegradable, and often accumulate in the environment causing both short and long term adverse effects, even at low concentrations. The adsorption process proved to be

economically feasible and efficient over other technologies, especially for removing pollutants from dilute solutions. In this sense new adsorbents based on nano materials are being extensively studied. With this in mind, the development of new, efficient and low cost nanomaterials for their application in water/wastewater has been of great interest in the last years, due to the special properties such as high reactivity and strong sorption. Abortion element carbon nanotubes has prepared by chemically vapor deposition method by utilizing ethylene which is a source of carbon and for this as catalyst Nano crystalline iron has used. Composites of the Nano crystalline iron and MW carbon nanotubes process has mention at article. The preparing of Composites of MW carbon nanotubes was conducted in a high temperature furnace at 800°C. After that the absorbent sample has prepare at normal room temperature under normal atmosphere. Modification in Surface of Composites of carbon nanotubes has performed through oxidation. For 24 hours of continuous agitation of 10 gram sample has taken for oxidized in solution of HNO3 at 30°C. To watch the impact of temperature the examinations were completed at four unique temperatures, i.e., 15°, 30°, 45° and 60°C.

Keywords: Multi-Walled Carbon nanotube, Methyl blue dyes, Orange-red dyes, Thermodynamic parameters, Carbon nanotube abortion.

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EMPLOYEE STRESS LEVEL AND ITS IMPACT ON PRODUCTIVITY

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Abstract - In today's business environment, there exist a lot of competition among companies. The efficiency of employees and the productivity of employees are a significant and important component of the success of an any business. The extreme stress faced in the working environment greatly impedes this efficiency and this has drawn the attention of many employers. And Knowing the factors leading to work stress and its impact on employee performance is vital for any organization to ensure its success and smooth functioning. The objective of this study was to investigate the impact of work stress on the performance of employees, using the purposeful and simple random approach to select the sample size of 200 participants. Using questionnaires and focus group discussion, data collection was conducted. The findings indicate that the participants suffer from undue stress that adversely affects their performance, as many of them feel that leadership exerts pressure on them to improve their performance.

Keywords: Employee Stress, Managerial Role, Stress Management, Job Performance.

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ANTIMICROBIAL ACTIVITY OF MANNICH BASES OF 1H-INDOLE-2,3-DIONE: A REVIEW

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Abstract - Resistance in pathogenic microbes is natural problem and it always provoke the researcher to develop more clinically important chemical moiety. Various Mannich bases of aromatic and heterocyclic compounds for their potent diverse microbial broad-spectrum activities have been reported. Mannich bases are results of Mannich reactions, which involve a nucleophilic addition reaction in which a condensation of active hydrogen with amines and aldehyde take place. Due to structure versatility of the 1H-indole-2,3-dione (isatin), it always attracts the researcher for the preparation of novel moiety with different substitution at position 5 and imine formation with condensation with 3-oxo group. In this brief review we focused on the Mannich bases of 1H-indole-2,3-dione with antibacterial and antifungal activity.

Keywords: 1H-indole-2,3-dione, Mannich base, antimicrobial activity, Mannich reaction.

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EMERGENCE OF OUTSOURCING WITH NEW BUSINESS MODELS FOR INDIAN PHARMACEUTICAL INDUSTRY

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Abstract - After modifications to the Indian patent system in 2005 made it possible to patent pharmaceutical items, the focus shifted to the development of novel medications. So, even though many Indian companies are investing heavily in pharmaceutical R&D, India is not yet an innovator's market. Strong FDI, mergers, and partnerships are occurring in India's pharmaceutical industry. The generics industry at home is eager to get into the lucrative international market. The number of ANDAs submitted to the FDA in the United States is likewise rising each year. There has been a shift in the industry's focus from the manufacturing of generic drugs to drug research and development. Following the 2019 release of the New Drugs and Clinical Trial Rules, the clinical testing sector has expanded fast, with many companies choosing India as a trial venue for their global Medicines. The commercial components of the sector are the primary focus of this research, which also suggests some changes to the existing business model and future directions.
Keywords: Emergence, outsourcing, business models, pharmaceutical industry.

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ESTIMATION AND EFFECT OF FASTING BLOOD GLUCOSE FOR TYPE 2 DIABETES

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Abstract- Blood glucose levels are determined via a fasting blood sugar test. Prediabetes, diabetes, and gestational diabetes may all be diagnosed in this straightforward, risk-free, and widely used manner. Impact and prediction of type 2 diabetes based on fasting blood glucose levels were investigated. When dealing with diabetes, it is crucial that blood sugar levels be kept within healthy ranges, and prompt detection and treatment of problems is also crucial.
Keywords: Blood, insulin, Type2, glucose, Diabetes.
