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November 2 to 4, 2023

PROGRAM & ABSTRACTS

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Translational Research in Drug Development

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Scientific Program

Thursday 2-Nov-2023

Dr Ajay Pràkash
Associate Professor, Postgraduate Institute of Medical Education and Research, Chandigarh

Topic: Drug Development Process and Current Indian Scenario

Dr Srinivas Seekallu

Head- Preclinical Research, Test Facility Management, Anthem Biosciences Pvt. Ltd. Bengaluru

Topic: Good Laboratory Practice (GLP): Overview and Importance in Preclinical Research

Wednesday 3-Nov-2023

Dr Mohamed Rafiq

Head - Discovery Sciences - R&D, Himalaya Wellness Company, Bengaluru

Topic: Natural Product Drug Development: Hyperuricemia A Case Study

Dr Pritesh Bhat

Principal Scientist, Schrodinger, Bengaluru

WhatsApp Mobile: +91 9900090055

Topic: Discovering Drug Molecules using the Schrödinger Platform – Overview and Case Studies

Wednesday 3-Nov-2023

Dr Jeyaraj D A

Vice President & Head, Discovery Chemistry, Jubilant Biosys Limited, Bangaluru

Topic: Antiviral Drug Discovery

Dr Abhijeet Rajendra Joshi

Assistant Professor, Department of Pharmacy, BITS Hyderabad

Topic: Neuropathic pain: insights into the Novel Mechanisms and the Therapeutic Targets

Dr Ekta Kapoor

Head, National GLP Compliance Monitoring Authority (NGCMA), DST, New Delhi

Topic: Role of NGCMA and GLP in India for Global Prospective

Dr Bikash Medhi
Professor, Postgraduate Institute of Medical Education and Research, Chandigarh

Topics: Organisation for Economic Co-operation and Development (OECD) and Good Laboratory Practice: How to File an Investigational New Drug (IND) Applications

Saturday 4-Nov-2023

Dr Anand P Kulkarni

Senior Principal Scientist & Head, Scientific Directorate, CSIR-Central Drug Research Institute, Lucknow

Topic: New Drug Discovery and Development in Independent India: Approaches, Success Stories and Way Forward

Dr R Govindarajan

Head R&D, Zydus Wellness, Ahmedabad, Gujarat

Topic: Challenges and opportunities from an industry perspective on herbal drugs

Dr Praveen Kumar M

Clinical Research Manager, n*f*erence, Indiqube, Bengaluru

Topic: Acceleration of Translational Drug Discovery with nferX Platform

Dr Ashok Godavarthi

C.E.O. Radiant Research Services Pvt Ltd, Bengaluru

Topic: Impact of In Vitro Models in Cosmetic and Consumer Care Product Research

National Conference on Translational Research in Drug Development

2 November 2023

Time	Program/ Presenter	Chairpersons	Topic
8:00 - 9:30 AM	Registration and Breakfast		
9:30 - 10:00 AM	Inauguration		
10.00 - 11.00 AM	Dr Ajay Pràkash Associate Professor, Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh	 Dr Ashok Shenoy K Professor Department of Pharmacology KMC Mangalore	Drug Development Process and Current Indian Scenario
11:00 - 11:30 AM	Tea Break		
11.30 - 12.30 PM	Dr Srinivas Seekallu Test Facility Management and Head, Preclinical Research and Development, Anthem Biosciences Private Ltd, Bengaluru		Good Laboratory Practice (GLP): Overview and Importance in Preclinical Research
12.30 - 2.00 PM	**Lunch Break**		
2.00 - 3.00 PM	Oral Presentations, Poster Session		
3.00 - 3.15 PM	Tea Break		
3.15 - 5.00 PM	Oral Presentations, Poster Session		

3 November 2023

Time	Program/ Presenter	Chairpersons	Topic
9.30 - 10.15 AM	Dr Mohamed Rafiq Head-Discovery Sciences, R&D, Himalaya Wellness Company, Bengaluru	 Dr Abdul Ajees Abdul Salam, Associate Professor, Department of Atomic & Molecular Physics, MAHE Manipal	Natural Product Drug Development: Hyperuricemia A Case Study
10.15 - 11.00 AM	Dr Pritesh Bhat Principal Scientist, Schrodinger, Bengaluru		Discovering Drug Molecules using the Schrödinger Platform – Overview and Case Studies
11:00 - 11:15 AM	Tea Break		
11.15 - 12.00 PM	Dr Jeyaraj D A Vice President & Head, Discovery Chemistry, Jubilant Biosys Limited, Bengaluru	 Dr Somasish Ghosh Dastidar Assistant Professor, Molecular Neurosciences, KMC Manipal	Antiviral Drug Discovery
12.00 - 12.45 PM	Dr Abhijeet Rajendra Joshi Assistant Professor, Department of Pharmacy, BITS Hyderabad		Neuropathic pain: insights into the Novel Mechanisms and the Therapeutic Targets
12.45 – 2.00 PM	Lunch Break		
2:00 – 3.00 PM	Dr Ekta Kapoor Head, National GLP Compliance Monitoring Authority (NGCMA), DST, New Delhi	 Dr Raviraja N S. Professor & Coordinator,	Role of NGCMA and GLP in India for Global Prospective
3:00 – 3.15 PM	Tea Break		
3:15 – 4.15 PM	Dr Bikash Medhi Professor, Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh		Organization of Economic Corporation and Development (OECD) and Good Laboratory Practice: How to File an

		Manipal Center for Biotherapeutics Research	Investigational New Drug (IND)
4:15 – 5.15 PM	GLP workshop		Standard Operating Procedure (SOP)

4 November 2023

Time	Program/ Presenter	Chhairpersons	Topic
9.30 - 10.15 AM	Dr Anand Kulkarni Senior Scientist, CDRI, Lucknow	 Dr KP Guruprasad Associate Director-Research & HOD Department of Ageing Research	New Drug Discovery and Development in Independent India: Approaches, Success Stories & Way Forward
10.15 - 11.00 AM	Dr R Govindarajan Head R&D, Zydus Wellness, Ahmedabad		Challenges and opportunities from an industry perspective on herbal drugs
11:00 - 11:15 AM	Tea Break		
11.15 - 12.00 PM	Dr Praveen Kumar M, Clinical Research Manager, nference, Indiqube, Bengaluru	 Dr Surulivel Rajan M HOD, Department of Pharmacy Practice MCOPS MAHE Manipal	Acceleration of Translational Drug Discovery with nferX Platform
12.00 - 12.45 PM	Dr. Ashok Godavarthi C.E.O. Radiant Research Services Pvt Ltd, Bengaluru		Impact of In Vitro Models in Cosmetic and Consumer Care Product Research
12.45 – 2.00 PM	Lunch Break		
2:00 - 3:00 PM	Valedictory		

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Oral Presentations

1. In vitro cell viability and expression studies of sesamol in human diabetic dermal fibroblasts

Fathima Beegum[1], Rekha R Shenoy[2], Nandakumar Krishnadas[3],
1. Women Scientist A, Department of Science and Technology, Government of India,
Research scholar, Department of Pharmacology, MCOPS, MAHE, Manipal
2. Associate Professor, Department of Pharmacology, MCOPS, MAHE, Manipal
3. Professor and Head in the Department of Pharmacology, MCOPS, MAHE, Manipal

Presenting author's email: fathimasubian609@gmail.com

Background: Delayed wound healing is one of the important characteristics of diabetes which is mainly due to hyperglycemia. In delayed wound healing under diabetic condition there observed change in expression of various markers which is important in promoting healing of wounds Sesamol, component of sesame seeds has showed wound healing potential in dexamethasone induced delayed wound healing and normal wound healing. Present study focused on evaluating the effect of sesamol in cell viability and expression of different markers in Human diabetic dermal fibroblasts.

Aim and Objectives: Evaluate cell viability and expression studies of sesamol in human diabetic dermal fibroblasts.

Methods: SRB assay is used to evaluate cell viability and to evaluate expression of various markers RT-PCR is used.

Results: SRB assay is performed and found out the effect of test molecule in cell viability, based on the assay two doses have been selected for further study. Expression of markers such as VEGF, TGF-beta, Akt, ERK, E-Cadherin, Snail-1, alpha SMA, MMP9, MMP-2, TIMP3 is done using RT-PCR and found out that sesamol increased the expression of markers (VEGF, TGF-beta, Akt, ERK, E-Cadherin, Snail-1, alpha SMA, TIMP3) significantly ($P<0.05$)and decreased MMP-9, MMP-2 expression significantly ($P<0.05$) thereby promoting wound healing.

Conclusion: There was observed significant change in expression of various markers involved in wound healing at two doses of sesamol selected by cell viability assay which indicates the wound healing potential of compound in diabetes.

Key words: Diabetic wounds, cell viability, human diabetic dermal fibroblasts

2. Efficacy of Feverfew for the Treatment of Migraine: A Meta-Analysis on the Randomized Double Blind Placebo Studies

Authors: Nelaturi Vineeth, Ronak Patil, Rekha R Shenoy, G L Vishwanath
Affiliations: Department of Pharmacology, Manipal College of Pharmaceutical Sciences, Manipal Academy of Higher Education, Manipal, Karnataka-576104)
Ronak Patil: -Second year student M-Pharm Pharmacology Manipal, Manipal college of pharmaceutical sciences Manipal, Manipal Academy of Higher Education, Manipal, Karnataka-576104
Rekha R Shenoy: -Associate Professor, Department of Pharmacology Manipal college of Pharmaceutical Sciences, Manipal Academy of Higher Education, Manipal, Karnataka-576104
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Presenting author's email: ronypatil58@gmail.com

Background: To Investigate efficacy of feverfew for Migraine prevention (for treatment and prophylaxis) as compared to placebo
Aim: Our study aims to look at the efficacy of the clinical effectiveness of feverfew in migraine prevention and treatment
Methods: In our study detailed literature study was performed for articles published until December 20, 2022, using electronic databases like PubMed, EMBASE, and Google Scholar. We included all the Randomized double-blind controlled trials (RCTs) published until December 20th, 2022, in the English language. Mean differences and their 95% Confidence interval (Cis) were calculated using random effects models.
Results: We discovered a total of 594 records using pre-specified search criteria after narrowing the results in number of data bases. Nine publications were chosen for systematic review meta-analysis comparing feverfew with placebo Five out of nine studies reported Feverfew has significantly reduced frequency of attacks IV: -1.11 [-1.23, -0.99] at 95% CI, p = <0.00001, I2 = 28% Four out of nine studies reported Feverfew has significantly reduced the severity of attacks IV: -0.63 [-1.48, 0.21] at 95% CI, p = 0.14, I2 = 85% For duration of migraine three out of nine studies reported that duration of attacks, placebo showed greater action when compared to feverfew, and has silently reduced the duration of attacks IV: 4.43 [1.23, 7.63] at 95% CI, p= 0.007, I2 = 98%
Conclusion: This "systematic review" and "Meta-analysis" in conclusion, do favour the idea that feverfew does decrease migraines. There was no correlation between the dosage of feverfew used. We found that feverfew can decrease the Frequency of attacks, Duration of attacks, and Severity of attacks.
Keywords (3-4 words): Migraine, Hemigranea, Feverfew, Tanacetum Parthenium.

3. Protective effects of ficus religiosa on sodium valproate induced gonadotoxicity in rats

Meghana Prabhu, Vasanthalaxmi, Manjula S D
Affiliations: Department of Physiology, Kasturba Medical College, Manipal Academy of Higher Education, Manipal, Karnataka-576104

Presenting author's email: meghana.kmcmpl2022@learner.manipal.edu

Background: Sodium valproate is an antiepileptic medication that is also used as a treatment for bipolar disorder. Gonadotoxicity, hepatotoxicity, and nephrotoxicity are its major side effects which are mainly due to its property of inducing oxidative stress. Oxidative stress causes changes in the cell functions by increasing base-pair oxidation, DNA fragmentation and denaturation, and gene mutations. Ficus religiosa is a major plant to be listed in traditional medicine, shown to have antioxidants belonging to various classes of compounds in various parts of this plant, especially in the bark. In this study, effect of aqueous extract of bark of F. religiosa was evaluated against gonadotoxicity caused by sodium valproate.
Aim: To evaluate the effects of aqueous extract of F. religiosa (FRAE) on Sodium valproate-induced gonadotoxicity in rats.
Methods: male wistar rats (n = 24) were treated with 100 mg/kg of FRAE and 400 mg/kg of sodium valproate for 28 days by oral gavage. At the end of treatment period, animals were weighed; testes and epididymis were collected and weighed immediately following the sacrifice and dissection of the animals. Sperm concentration was calculated using epididymal homogenate using Neubauer chamber. Depending on the pattern of motility, spermatozoa were divided into nonmotile, non-progressively motile, and progressively motile spermatozoa. Based on morphology, spermatozoa were classified as normal and abnormal spermatozoa. Histological examination of testis was done using H & E staining. Testicular homogenate was used for colorimetric assessment of GSH and MDA levels. The data thus obtained was meticulously analyzed using the one-way ANOVA with the help of Graph pad Version 8 software. The level of statistical significance for any measure was set at $p<0.05$ at a confidence interval of 95%. The values are expressed as mean±standard error of mean (SEM).
Results: In our study, FRAE treatment had a positive effect on animals treated with sodium valproate. FRAE treatment successfully attenuated the effect of sodium valproate on sperm concentration, total motility of sperms, levels of testicular GSH and MDA. There was no significant difference in body weight, testicular weight, epididymal weight, sperm morphology and histopathological parameters among various groups. Treatment with FRAE only caused decrease in sperm motility compared to control. This could be due to estrogenic property of any of the phytochemical components of F. religiosa.
Conclusion: Further studies must be carried out in detail to find out role of F. religiosa in fertility with additional investigations on various parameters at various time points, as well as with different doses and various extracts of different parts of F. religiosa. However, FRAE might be an advantageous supplement for epileptic patients with sodium valproate therapy.
Keywords (3-4 words): Sodium valproate, Ficus religiosa, oxidative stress, gonadotoxicity.

4. In vivo investigation of p-coumaric acid on LPS-induced neuroinflammation associated memory loss in rats

Jayesh Mudgal[1], Manas Kinra[1], Madhavan Nampoothiri[1], Devinder Arora[2]

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Background: Intracerebroventricular (ICV) administration of lipopolysaccharide (LPS) is frequently employed as an *in vivo* neuroinflammation and cognitive impairment model in experimental animals. LPS activates the surface-bound TLR-4 receptors which in turn activate the nucleotide-binding domain and leucine-rich repeat protein-3 (NLRP3) inflammasome pathway via nuclear factor kappa B signaling. This pathway of protein complexes then leads to the activation and release of interleukin-1β (IL-1β) from the cells of innate immunity. Activation of microglia has been observed in the development of neurodegenerative diseases. As evident from the acute *in vivo* published study, the selected phenylpropanoic acid derivative i.e. p-coumaric acid (PCA) has the potential to alleviate the neuroinflammation by inhibiting the NLRP3 inflammasome pathway. For this study, since the activating agent LPS was administered centrally, a more profound and direct effect on learning and memory could be observed which can substantiate the possible efficacy of PCA.

Aim: To study the effect of PCA on LPS-induced neuroinflammation and associated memory loss.

Methods: Male Sprague Dawley rats, 180-200g were selected for the study. All experimental protocols were approved by the Institutional Animal Ethics Committee of Kasturba Medical College, Manipal, MAHE. For this study, rats were used to assess the activity of the selected compound, PCA at the dose of 160mg/kg p.o, against ICV-LPS-induced cognitive decline as well as changes in the inflammatory state in the brain. Morris Water Maze test was employed to assess the spatial memory using the escape latency, number of island entries, and time spent in target quadrant. To correlate the outcomes, brain cytokine levels and oxidative stress were evaluated in the brain. Statistical Analysis was performed to find the significance between multiple groups by applying one way analysis of variance followed by post hoc Dunnet's test using GraphPad Prism ver 10 software.

Results: Ten days of simultaneous treatment with PCA significantly reversed the LPS-induced increase in escape latency in rats. There were no significant changes observed in any other behavioural tests. However, significant elevation in brain IL-1β and malondialdehyde levels were observed. These changes were significantly reversed by PCA.

Conclusion: In conclusion, it can be suggested that in the given regimen PCA was significantly effective in reducing the LPS-induced spatial memory impairment by reducing the proinflammatory cytokine and oxidative stress. These findings were in line with the previously published report where PCA was found to inhibit NLRP3 inflammasome pathway and associated neuroinflammatory disorder. Thus, these results supports the potential of PCA against neuroinflammation-induced neurodegenerative disorders, especially against NLRP3-inflammasome-mediated neuroinflammation and can be evaluated and developed further in detail.

Keywords (3-4 words): LPS; neuroinflammation; p-coumaric acid, memory loss

5. Biochanin-A Prevents Statin-Induced Diabetes in a High Sucrose-Fed Rodent Model

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Department of Pharmacology, Manipal College of Pharmaceutical Sciences, Manipal Academy of Higher Education, Manipal- 576104, Karnataka, India
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Background: Statins, which are commonly used to manage high cholesterol, have come under scrutiny due to a recent FDA warning linking them to diabetes. Biochanin-A, an isoflavone, has demonstrated its effectiveness in countering diabetes and high lipid levels. However, its potential in preventing statin-induced diabetes has not been explored yet.
Aim & Objectives: Our aim was to induce a pre-diabetic condition and examine the role of statins to induce diabetes and to assess the protective role of Biochanin-A in preventing statin induced diabetes.
Methods: Procedures were approved by the Institutional Animal Ethics Committee. Wistar rats (n=24) were fed a high sucrose diet (HSD) to induce pre-diabetic status, while a control group (n=6) received standard chow for 90 days. After confirming pre-diabetic conditions with OGTT and FBS analysis, HSD feeding continued until the study's end. Post pre-diabetic development, rats were regrouped (n=6), receiving Atorvastatin (30mg/kg) and Biochanin-A (30mg/kg) daily for 90 days. Euthanasia used xylazine (360mg/kg)/ketamine (40mg/kg), preserving tissue samples for HC analysis.
Results: Pre-diabetes was induced in animals through 90 days of HSD feeding, as confirmed by FBS and OGTT results showing significant differences compared to the control group. Subsequent treatment with 30mg/kg Atorvastatin and 30mg/kg Biochanin-A, alone or in combination, for 90 days revealed increased FBS levels in the statin-alone group, indicating statin's potential to worsen hyperglycemia. Throughout the study, all groups showed a steady increase in body weight, with the HSD-alone group gaining the most weight. On day 180, HbA1C levels in the HSD and statin-alone groups fell within the pre-diabetic range (6.25% and 6.35%, respectively), while the Biochanin-A+Statin group maintained HbA1C levels within the normal range. In OGTT analysis, the HSD-alone group displayed the highest AUC and poor glucose tolerance, followed by the statin-alone group. The Biochanin-A+Statin group showed improved results. Furthermore, the HSD group exhibited elevated total cholesterol and triglyceride levels, while other groups remained within normal ranges.
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Conclusion: Atorvastatin may exacerbate the hyperglycaemic effect of high sucrose feeding on glucose tolerance. Biochanin-A can protect against statin-induced worsening of diabetic condition.
Key Words: Biochanin-A, Atorvastatin, Diabetes, High Sucrose Diet

6. Drug-Entangled Multi-Walled Carbon Nanotubes Against Breast Cancer: A Computational and Pharmacological Approach

Sandra Ross O S [1], Govardhan K R[1], H R Sameera[1], Shannon D Almeida[1], Golla Sireesha[2], Soundarya R[2], J Anbu[1], Damodar Nayak A[1], Parasuraman Pavadai[2]

[1]Department of Pharmacology, Faculty of Pharmacy, M.S. Ramaiah University of Applied Sciences, Banglore-560054, Karnataka, India

[2]Department of Pharmaceutical Chemistry, Faculty of Pharmacy, M.S. Ramaiah University of Applied Sciences, Banglore-560054, Karnataka, India

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ABSTRACT

Background: Cancer is a leading cause of mortality worldwide, with breast cancer incidence on the rise due to various factors. The challenge in efficient cancer treatment persists due to non-specific drug delivery methods.

Aims: The study aims to assess the potential of a folic acid-conjugated Capsaicin-loaded carboxyl functionalized multi-walled carbon nanotube (FA-CAP-COOHMWCNT) as an anti-neoplastic agent against breast cancer.

Methods:

- FA-CAP-COOHMWCNT formulation and characterization were conducted using FTIR, SEM, HRTEM, XRD, Zeta Potential, and Particle Size analysis.
- In vitro cytotoxicity of FA-CAP-COOHMWCNT was assessed against the MCF-7 cell line, yielding a concentration of 50µg/ml.
- The anti-cancer activity was evaluated against 7-12, Dimethyl Benzanthracene (DMBA) induced breast cancer in female Wistar rats, with doses of 2.5mg/kg, 5mg/kg, and 10mg/kg of the formulation. This was compared with a standard group treated with Doxorubicin (4mg/kg).
- Parameters such as breast tumor size, hematological, biochemical, and antioxidant properties were measured.

Results: The high dose of 10mg/kg of FA-CAP-COOHMWCNT exhibited the most significant antioxidant properties and substantial reduction in tumor size, nearly equivalent to the standard drug (Doxorubicin). Histopathological studies also revealed near-normal tissue architecture, indicating the anti-cancer potential of FA-CAP-COOHMWCNT.

Conclusion: In conclusion, FA-CAP-COOHMWCNT shows promise as an anti-neoplastic agent against breast cancer. Its remarkable anti-cancer activity, particularly at the higher dosage, along with its antioxidant properties, suggests it could be a potential candidate for further development in breast cancer treatment.

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Keywords: Breast Cancer, Molecular Docking & Dynamics, Carbon Nanotubes, Capsaicin, DMBA

7. Neuroprotective effect of Infliximab Against Chemotherapy-Induced Cognitive Dysfunction in a Mouse Model of Breast Carcinoma

Author: Muhammed Fayaz, Tanya Shukla, Jeena John, Nandakumar Krishnadas.
Affiliations: Department of Pharmacology, Manipal College of Pharmaceutical Sciences, Manipal Academy of Higher Education, Manipal, Karnataka-576104.

Background: Breast cancer is one of the most pervasive cancers among women, with an annual 2.3 million new cases (11.7 percent), female breast tumour has replaced the most commonly recognized malignancies. Studies have shown that adjuvant systemic therapies for breast cancer have been shown to possess a significant impact on cognitive abilities, referred to as chemo brain or chemo-fog affecting the well-being of patients. Patients endure the agony of gaps in memory, inability to do complex and multistep tasks, reduced focus, and diminished processing speed. Researchers have revealed properties of the monoclonal antibody Infliximab, that can ameliorate cognitive dysfunction by targeting mechanisms like neuroinflammation, and oxidative stress. The study investigates the potential of Infliximab to reduce the pro-inflammatory cytokine levels in the brain and thereby alleviating chemobrain symptoms.
Aim: To determine the neuroprotective effect of Infliximab against CMF (Cyclophosphamide, Methotrexate and 5-Fluorouracil) -induced cognitive decline in a mouse model of mammary carcinoma.
Methods: Triple-negative breast cancer induction was performed by subcutaneously administering 4T1 cells into the mammary fat pad of female balb/c mice. The tumour size progression was examined (within 14 to 20 days). Animals divided into five different groups, having 5 animals in each group. A combination of chemotherapy (CMF) and Donepezil/Infliximab was administered once a week for three weeks (day 21-42). After 3 weeks of chemotherapy, memory assessment was performed by Morris Water Maze (MWM) test which was followed by the estimation of different biochemical parameters.
Result: Treatment with Donepezil and Infliximab showed a remarkable decrease in cytokine level (IL-1 beta, IL-6 and TNF-alpha) compared to the disease control group, indicating the anti-inflammatory activity of both drugs. IL-6 is one of the important pro-inflammatory cytokines, and it was increased in tumour control and CMF treated group but significantly decreased in the standard and test drug group.Infliximab restored the level of malondialdehyde compared to the CMF- treated group and slightly increased the level of catalase. The animals were subjected to Spatial memory navigation test or MWM test. In this test disease control group animals showed a significant increase in escape latency and decrease in retention time which were reversed in test drugs when compared with disease control group.
Conclusion: Infliximab treatment and the standard drug Donepezil reduced the cognitive dysfunctions induced by chemotherapy based on MWM, antioxidant, and ELISA test results without disturbing the anticancer activity of chemotherapy. The restoration of cognitive decline by infliximab was found to be due to its antioxidant, and anti-inflammatory mechanisms. Our research has disclosed a significant insight into the CMF process, which may disclose the impact of Infliximab on cognitive functions following chemotherapy.
Keywords: Breast Cancer, Chemotherapy, Cognitive impairment, Neuroprotection

8. Design, Synthesis and Characterization of N-alky l-3-ary l- 1H- pyrazol - 5- a mine derivatives as potential anti-leishmanial agents

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Affiliations: Department of Pharmaceutical Chemistry, Manipal College of Pharmaceutical Sciences, Manipal Academy of Higher Education, Manipal, Karnataka-576104.

Abstract:-

Background: Leishmaniasis is a neglected disease caused by protozoan parasites belonging to trypanosome genus Leishmania. As of now, there is no vaccine for leishmaniasis. Sodium stibogluconate is a first line drug for leishmaniasis. Liposomal amphotericin B, Paromomycin, Miltefosine are some other agents used in the treatment.

There is a need to find safe and efficacious for leishmaniasis. Nitrogen heterocycles are found abundant in drugs of natural as well as synthetic origin. Pyrazole derivatives have known to possess therapeutic activity.

Aim: To design, synthesize and characterize N-alkyl-3-aryl-1H-pyrazol-5-amine derivatives as potential anti-leishmanial agents

Methods: Several N-alkyl-3-aryl-1H-pyrazol-5-amine derivatives were designed. Using picolinic acid as the starting material, 1-phenyl-N-(3-(pyridin-2-yl)-1H-pyrazol-5-yl)-methanimine was synthesized by multi-step synthesis. Synthesized molecule was characterized by using TLC and LC-MS. SwissADME and Molinspiration were used to determine ADMET properties of all the designed molecules. Toxicity was determined using Protox-2.

Results: Several N-alkyl-3-aryl-1H-pyrazol-5-amine derivatives were designed and among them 1-phenyl-N-(3-(pyridin-2-yl)-1H-pyrazol-5-yl)-methanimine was synthesized. After every step of synthesis, TLC and mass spectroscopy was performed to confirm the synthesis of the intermediates and the final product. All the designed molecules were subjected to in-silico studies using various software (SwissADME, Molinspiration and Protox-2).

All molecules followed Lipinski's Rule of 5 and may be orally bioavailable.

All the designed molecules fell into toxicity class 3 or 4 indicting that they might be harmful but not fatal. All the molecules may be hepatotoxic. Some may be carcinogenic or mutagenic. None of the synthesized molecules showed cytotoxicity and immunotoxicity. Overall, it can be concluded that the designed molecules are comparatively safe for oral consumption.

Based on the in-silico studies alone, the halogen substituted derivatives were found to be less toxic and more effective than the other derivatives.

Conclusion: Leishmaniasis is a neglected tropical disease for which no vaccines are available currently. The treatments are available are limited and there is a need to find newer therapeutic measures. As nitrogen heterocycles are commonly observed in drug molecules, N-alkyl-3-aryl-1H-pyrazol-5-amine derivatives were designed and synthesized as potential anti-leishmanial agents. The designed molecules were further characterized by determining their pharmacokinetic parameters and ADMET profile using various web-based tools. Studying these properties would help to understand the nature of compounds thereby providing assistance to identify promising molecules. Further biological studies would be required to confirm the efficacy and safety of the designed molecules.

Keywords: Leishmaniasis, pyrazol-5-amine, ADMET, in-silico studies

9. The abstract submitted: Oral presentation Fibrinolytic Enzyme from a Marine Soil

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Dept. of Pharmaceutical Biotechnology, Manipal College of Pharmaceutical Sciences, Manipal Academy of Higher Education, Manipal.

Background: Cardiovascular diseases are a leading cause of morbidity and mortality globally with the heavy economic burden. Acute heart attacks and strokes are mainly caused due to blockage in blood vessels preventing blood from flowing to the heart or brain. Administration of antiplatelet drugs, anticoagulants, fibrinolytic enzymes and performing surgical procedures to prevent blockage and clot formation are being tried with varying success. Microbial fibrinolytic enzymes viz., streptokinase, urokinase, nattokinase etc., have gained commercial importance. However, more work needs to be carried out to achieve cost-effectiveness and therapeutic compatibility of such formulations. Fungal fibrinolytic enzymes have gained increasing attention due to their potential therapeutic applications in thrombolytic therapy.
Aims: To identify fungal fibrinolytic enzymes from marine soil.
Methods: As a step in this direction, a systematic isolation procedure was carried out by screening samples collected from marine, slaughterhouse, garden fish effluent, paddy fields, confectionary food waste and poultry farm soils in and around Udupi. All the isolates were screened for fibrinolytic activity. For fibrin degradation, fibrin was prepared using chicken blood collected from a nearby slaughterhouse.
Results: Out of the 56 isolates collected, 17 isolates showed proteolytic activity (as seen from Caseinolytic activity). These were also checked on Sheep blood Agar plates for haemolytic activity. Of these 9 isolates showed haemolytic zone. Simultaneously all these 17 isolates were tested for fibrin degradation. Isolate MFS-15 which had the highest proteolytic zone as well as less degree of haemolytic zone was chosen for fibrinolytic enzyme production. MFS-15 isolate was grown on a broth medium having glucose (0.02%), potassium nitrate (1%), K_2HPO_4(0.1%), KH_2PO_4 (0.1%) with alkali-soluble casein (1.5%) and incubated on a shaker incubator for 4 days at 30^{o}C with 150 rpm. The isolate liberated 313.11 µg/ml of tyrosine. The proteolytic enzyme was extracted using 60% Ammonium sulphate at 4^{o}C. Further purification is carried out by dialysis against phosphate buffer saline (pH 7.0). The dialyzed fraction of the enzyme had 0.458 U/mg specific activity. SDS-PAGE was performed by using a Protein ladder and BSA as standards. Two bands were observed at 72 kDa and below 17 kDa**.** The results compared well with the reported literature and further work on the stability of the enzyme is contemplated.

10. Goan Cuisine: A Spicy Symphony of Anti-Inflammatory Adaptogens

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Background:

Goan cuisine is a unique and flavorful cuisine that is influenced by the Portuguese, Indian, and African cultures that have settled in Goa over the centuries. Goan cuisine is known for its generous use of fresh spices. The modulation of our immune system by herbs and spices has been reported in numerous traditional medicinal texts as well as modern scientific research. Many of the spices and other ingredients used in Goan cuisine have anti-inflammatory and adaptogenic properties. For example, turmeric is a well-known anti-inflammatory spice, while ginger is an adaptogenic spice that can help the body cope with stress. Other anti-inflammatory and adaptogenic spices used in Goan cuisine include black pepper, cinnamon, chillies. Our traditional literature contains a lot of information on the medicinal properties of spices and hence these claims are to be verified by analysing pre-existing scientific data of these spices and their phytoconstituents. The effects of these phytoconstituents can be measured on a biochemical level by measuring their effects on specific inflammatory biomarkers such as IL-6 and TNF-α.

Aim: To study the immunomodulatory properties of ingredients used in Goan cuisine based on their effect on expression of inflammatory biomarker levels.

Method: A meta-analysis of existing scientific literature on research conducted on the phytochemical properties of ingredients used and their pharmacological effects.

Conclusion: A balanced and complete diet is essential for our health and well-being. And based on analysis of established scientific data, it can be concluded that the spices and ingredients present in Goan cuisine show immunomodulatory and anti-inflammatory properties. Which may be a contributing factor towards the extended longevity of Goans, who have the 3rd highest lifespan in the country.

Keywords: Immunomodulation, Biomarkers, Phytochemicals, Inflammation

11.Comparison Between Wound Healing Activity of Aqueous and Alcoholic Extract of Andrographis Paniculata On Dead Space Wound Model

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Background: Andrographis paniculata Nees (Ap), is commonly known as 'Kalmegh' widely used in traditional medicine to treat various diseases,. Extracts of Ap and its major constituent andrographolide shows anti-inflammatory, antioxidant, activities.

Aim: To study the comparative effect of wound healing activity of aqueous and alcoholic extracts of leaves of *Andrographis paniculata* (AP) using dead space wound model in albino rats.

Methods: - Albino Wistar rats of either sex, weighing around 150-250g, divided into 3 groups of 8 animals each. Group I: Control group with wound and treated with saline. Group II: Test group with wound and treated with 400mg of aqueous extract of Ap,Group III: Test group with wound and treated with 400mg of alcoholic extract of Ap. Dead space wound was created by implanting two polypropylene tubes. On the 10^{th} post- wounding day, the granulation tissue formed on the implanted tubes was carefully dissected out. The breaking strength of granulation tissue was measured. Granulation tissue collected and used for the estimation of glycosaminoglycans such as hydroxyproline, hexosamine and hexuronic acid.

Results: There was a significant increase in the wound breaking strength, hydroxyproline, hexuronic acid and hexosamine levels in both alcoholic and aqueous extract of Ap .This result was very significant in aqueous extract of Ap treated rats.

Conclusion: The prohealing action.of Ap is probably due to its antioxidant properties as it is rich in Flavonoids, which scavenge the free radicals and helps in wound repair. The aqueous extract of Ap exhibits greater antioxidant activity than ethanolic extract as it contains higher flavonoids content.

Keywords (3-4 words): Andrographis Paniculata, Wound healing, Dead space, Rats

12. Protective Effect of Mucuna Pruriens on Fluoxetine (Antidepressant) Induced Testicular Dysfunction In Chronic Unpredictable Mild Stress (Cums) Rat Model

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Background: Fluoxetine (FLX), a popularly prescribed medication for treating deprssion. Long-term FLX use resulted in reduced spermatogenesis, follicle-stimulating hormone, thyroid-stimulating hormone & weights of the reproductive organs. Mucuna pruriens is also called velvet bean is a potent medicinal plant that has been used for a long time in tropical areas, as an adjunctive therapy for male infertility. Mucuna pruriens seed extract has been found to have pharmacological actions that include anti-oxidative, anti-inflammatory, anti-hypertension, anti-diabetes. It has been demonstrated that Mucuna pruriens seed enhances the antioxidant enzymes and semen quality in the seminal plasma of infertile men.

Aim: To study the protective effect of Mucuna pruriens on fluoxetine (antidepressant) induced testicular dysfunction in chronic unpredictable mild stress (CUMS) induced male rats.

Methods: 30 Albino Wistar male rats weighing 180-250gm, aged around 3 months old were used. CUMS will be induced for the first 4 weeks. The depression induced in the rats confirmed by sucrose preference test and forced swimming test. Animals were allocated into 5 groups of 6 animals each, group 1- control , group 2- CUMS Group 3- CUMS + fluoxetine , Group 4- CUMS+ aqueous extract of Mucuna prureins and Group 5- CUMS+ fluoxetine + aqueous extract Mucuna pruriens. At the end of the treatment period, Animals were weighed, after the animals were sacrificed, testes, epididymis, were removed and weighed. One of the testis was preserved in formalin and used to create histology slides, while the other was conserved in PBS (phosphate buffered saline) and kept at -80°C for biochemical parameters such as testicular Malandialdehyde (MDA) and Glutathione (GSH). The cauda epididymis of the rats were dissected out to create a homogenized solution with a pH of 7.2 in 1 ml of PBS and solution was used to assess sperm parameters like sperm count , sperm motility

Results: Aqueous extract of Mucuna pruriens showed a significant improvement in testicular weight, sperm count and motility, histopathological changes and testicular MDA and GSH level in fluoxetine (FLX) treated and depression induced rats.

Conclusion: Mucuna pruriens shown improvement in the sperm count, motility, lipid peroxidation which indicates its protective effect against the fluoxetine. This beneficial effect of Mucuna pruriens could be due to increased endogenous level of antioxidants levels and decreasing free radical level as Mucuna pruriens is rich in flavonoids.

Keywords (3-4 words): Mucuna pruriens, Fluoxetine, chronic unpredictable stress, sperm count and motility.

13. Effect of Aqueous Extract of Andrographis Paniculata Nees On Dexamethasone Suppressed Wound Healing In Incision And Excision Wound Models In Rats

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Background: Dexamethasone (DM) is a very potent anti-inflammatory glucocorticoid used in organ transplantation and skin allografts. Dexamethasone is known to depress all aspects of wound healing. Andrographis paniculata (Ap) has anti inflammatory and, antioxidant activity which shows prohealing activity

Aim: To study the effect of wound healing activity of aqueous extracts of leaves of Ap on Dexamethasone suppressed wound healing in incision and excision wound models in rats

Methods: - Albino Wistar rats of either sex, weighing around 150-250g, divided into 4 groups of 8 animals each. Group I: Control group with wound and treated with saline. Group II: Test group with wound and treated with 400mg of aqueous extract of Ap, Group III: Test group with wound and treated with Dexamethasone, Group IV: Test group with wound and treated with Dexamethasone and extract of Ap. Wound breaking strength was measured in incision wound model and % of wound contraction and the epithelization period was measured in excision wound model

Results: In dexamethasone treated rats, there was decrease in the Tensile strength, decrease in % wound contraction rate and increase in the epithelisation period, but in rats given DM along with aqueous extracts of Ap a significant increase in the Tensile strength and % wound contraction rate and decrease in the epithelisation period

Conclusion: Leaves of Ap are rich in flavonoids which could be the reason for the pro healing action in Dexamethasone treated rats

Keywords (3-4 words): Andrographis paniculata, Wound healing, Incision wound , Excision wound, Rats.

14. Integrated computational methods to unravel the mechanism of gentiopicroside to treat pulmonary fibrosis

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Abstract:
Background: Pulmonary fibrosis is a complex interstitial lung disease. The application of network pharmacology provided insight into exploring the multitarget therapeutic approach required to treat pulmonary fibrosis perturbation networks. Gentiopicroside is a substantial component of Swertiya chirayita in treating pulmonary fibrosis and to validate the network approach, molecular docking was attempted.
Aims: To explore the molecular mechanism of gentiopicroside in Swertia chirayita through network pharmacology and molecular docking.
Methods: Components of Swertia chirayita were identified using a TCMSP database and literature search. The probable targets of the identified compounds were obtained from the SuperPred database. Disease targets with the cutoff score were taken from the DisGiNET and GeneCards. Overlapped targets between the compound and disease were uploaded into the Cytoscape (String protein query) to build a protein-protein interaction (PPI) network. Core targets were identified from the PPI network by analysing the three major topological parameters in a network (Degree, Betweenness, and Centrality). Bioinformatic analysis was performed to identify the gene ontology and pathway annotations using the DAVID database. The PDB IDs of the major targets were identified for the molecular docking (Schrodinger). Proteins and ligands were prepared using Protein Preparation Wizard and LigPrep respectively. Molecular docking was performed and considered gentiopicroside for 100ns molecular dynamics (MD).
Results: A protein-protein interaction network of 114 nodes and 869 edges was obtained for Swertia chirayita. Overall, 22 targets were identified as hub targets and core targets (TNF, MMP9, EGFR, IL6, AKT1, MAPK3, STAT3, and SRC) which centers in the network of lung fibrosis and are considered for the molecular docking. Gentiopicroside is one among the other potential components which exerted a good docking score and interactions from Swertia chirayita and is considered for MD simulation. MD simulation of MMP9-gentiopicroside has shown reported inhibitory amino acid interactions (A strong H-bond interaction with GLU227 and Pi-cation interaction with HIS226, HIS230, and HIS236) and retained RMSD within the range at 2Å. RMSD of TNF-gentiopicroside resides within 2Å and there were constant H-bonds formed during the 100ns simulation period with the inhibitory amino acids SER60 and TYR151. Bioinformatics analysis of the network explored the molecular pathways including EGFR tyrosine kinase resistance, PI3K-Akt, HIF-1, TNF, and FOXO signaling pathways in treating pulmonary fibrosis with the major biological process inhibition (inflammatory reaction, angiogenesis, proliferation, and apoptosis of damaged epithelial cells).
Conclusion: The gentiopicroside may prevent epithelial cell damage and inflammatory reactions in the alveoli by interacting with the responsible core targets and pathways as reported in the bioinformatic analysis. Molecular docking studies on gentiopicroside have shown confirmed therapeutic activity on pulmonary fibrosis targets. However, the complete therapeutic effect will be concluded after the in vitro and in vivo pharmacological studies which are under progression.
Keywords: Pulmonary fibrosis, Gentiopicroside, Bioinformatics, Molecular docking.

15. Integrative Analysis of AMPK Subunits in Colorectal Adeno Carcinoma Patients

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Keywords: Shh signaling, GLI1, Pathway alteration, differential expression

Background: The 5-adenosine monophosphate (AMP)--activated protein kinase (AMPK) is an emerging cancer treatment and therapeutic target. Due to the enzyme's complexity and dual nature, it is a confounding target in the treatment strategy. The study aimed to conduct an integrative analysis of the seven subunits and twelve isoforms of AMPK, which has not been reported so far in Colorectal adenocarcinoma patients.

Objective

The study aimed to analyze the expression of AMPK subunits in normal and primary tumors, in each stage of COAD, expression during the nodal metastasis, association with patient's weight, and protein-level expression. The study also analyses the Overall Survival of CRC patients in AMPK subunit expressed and non-expressed patients.

Methodology: The web-based tools UALCAN, Timer 2.0, KM Plotter, cBioPortal, COSMIC, and STRING were used to investigate the differential expression of AMPK subunits, protein-level expression, promoter methylation status, survival analyses, Enrichment analysis, and protein-protein interaction.

Results: The mRNA expression of AMPK subunits is upregulated in Colorectal Adeno Carcinoma (COAD), while the protein expression is comparatively reduced in colon tumors. The protein-level expression of γ 2 is significantly reduced in COAD patients. The γ 2 subunit both in normal and colon tissue is hypomethylated, and the γ 3 subunit in colon tumor is hypermethylated. The study also reports that Liver Kinase B1 mutation is present in 7% of CRC patients may be the reason for the downregulation of the gene and the protein expression of AMPK subunits in COAD.

Conclusion: The Overall analysis of the subunits affirms that AMPK expression is beneficial in cancer. As a concluding note, the genes encoding the AMPK subunits are upregulated in COAD, while the protein expression is comparatively reduced in colon tumors. The γ 2 subunit both in normal and colon tissue are hypomethylated and the γ 3 subunit in colon tumor is hypermethylated. The OS analysis of the subunits affirms that AMPK expression is beneficial in cancer. The downregulation of the gene and the protein of AMPK expression might be due to the mutation of the upstream kinase LKB1.

Keywords: AMPK, Colorectal Cancer, Differential gene expression, Protein expression, Survival analysis.

Poster Presentations

Stream 1: Conceptual Review papers

1. Advancement of the Artificial Intelligence in the Prognosis of Multiple Diseases through Eye (Ocular) Scans

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Abstract:
Progression of Artificial Intelligence in the field medical diagnostic analysis, treatments and management of public health has provided new and exceptional approaches for early prediction or prognosis of the various diseases.
This work contains information about how artificial intelligence can be utilized to predict the variety of diseases at early stages as possible by analysis of the eye (ocular) scans associated with it.
The human eyes can give unique perception of the overall health of human body and latest studies and research have revealed that artificial intelligence has great potential to determine the possibilities using AI logarithms and correlate them.
Making use of advanced technologies such as deep learning, machine learning, computers vision and neural networks, AI models can recognize, select and create precise patterns and abnormalities among various eye scans which also includes retinal imaging and OCT scans.
Prediction of Cardiovascular diseases (CVD) and Diabetes are two major encouraging approaches done by artificial intelligence. Variations in the vasculature of retina and existence of retinal microaneurysms can be identified by artificial intelligence which serves as early signs of the underlying diseases and provide effective intervention and threat assessment.
Additionally, artificial intelligence has potential to demonstrate incredible accuracy in preliminary detection of neurodegeneration disorders mainly Alzheimer's disease and Parkinson's disease by analysis of ocular scans associated with it.
Patterns associated with changes in blood vessels, retina, cornea, iris, pupil size, optical nerve head and movement of the eyes can be detected and correlated with underlying disease by AI model.
By detecting unique biomarkers and irregularities found in the eye scans, the AI model provides advanced detection of particular types of cancers which includes breast cancer metastasis and melanoma and helps to improve patient outcomes.
In conclusion, incorporation of artificial intelligence in the field of Opthalmic diagnostics has created a novel opportunity in the prognosis of a variety of diseases. Ocular scans analyzed by the AI models provide capabilities to detect, prevent, treat and manage diseases as early as possible. Continuation of advancements in the research and development in the medical field associated with artificial intelligence can lead to the transformation of healthcare and improvisation of patient outcomes.
Keywords: Artificial intelligence, early detection, deep learning.

2. Nanorobots in Cancer Diagnosis and Therapy: A Nanoscale Revolution

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Background: Nanorobots, defined as "nanoscale devices that can be programmed to perform specific tasks at the molecular level," have emerged as promising tools in the field of nanomedicine. Therefore, their size, comparable to biological molecules, enables precise interactions at the cellular and subcellular levels. In this regard, nanorobots hold immense potential to revolutionize diagnosis and therapy for various diseases, especially cancer.
Aims: This poster presentation aims to explore the applications, benefits, challenges, and future prospects of nanorobots in cancer diagnosis and therapy. The specific objectives include:

- To present key roles of nanorobots in cancer diagnosis and treatment
- To evaluate the potential benefits and challenges associated with nanorobot-based cancer therapies
- To envision future prospects and synergies of nanorobotics with emerging technologies

Methods: We conducted a comprehensive review of literature from peer-reviewed journals, books, and conference proceedings to gather insights into the current state of nanorobotics in cancer treatment. Our analysis focuses on the capabilities of nanorobots, their diverse applications, and the hurdles they face in clinical translation. We also explored future directions and possible synergies with other cutting-edge technologies such as artificial intelligence, gene editing, immunotherapy, etc.
Results: Nanorobots offer versatile solutions for cancer diagnosis and therapy. Some of the key roles of nanorobots are:

- Detection: Nanosensors can detect cancer biomarkers at an early stage with high sensitivity and specificity
- Delivery: Nanocarriers transport therapeutic agents to the tumor site with minimal systemic toxicity
- Surgery: Nanoscalpels perform precise surgeries without damaging healthy tissues
- Mitigation: Nanosponges mitigate side effects by absorbing excess drugs or toxins
- Navigation: Nanoswimmers navigate intricate anatomical structures by mimicking natural microorganisms

The potential benefits of nanorobots include personalized and targeted treatment, reduced drug dosages, real-time monitoring, and improved patient outcomes. However, challenges encompass design complexity, biocompatibility, physiological barriers, and regulatory issues.
Conclusion: Nanorobots represent a transformative approach to cancer treatment. Their ability to operate at the molecular level offers precise and personalized solutions, potentially improving treatment efficacy while reducing toxicity. Overcoming technical and regulatory challenges will be critical for their successful integration into clinical practice. Furthermore, the future of nanorobotics in cancer treatment lies in synergies with artificial intelligence, gene editing, immunotherapy, and applications beyond cancer. Nanorobots could pave the way for a new era of nanomedicine, where molecular precision and biomimicry enable novel and effective therapies for various diseases. Therefore, we recommend further research and development of nanorobots, as well as collaboration and communication among stakeholders, to realize their full potential and benefits for human health.
Keywords: Nanorobotics, Cancer diagnosis and therapy, Nanomedicine, Personalized medicine.

3. Quantum Dots: Seeds for Nanotechnology & Healthcare Systems

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Background: Quantum dots or QDs are known as specks of matter in nanotechnology, with a size ranging from 2-10 nm. They are usually composed of the elements belonging to the groups II to VI and III to V of periodic table. They have unique characteristics including photo stability, chemical stability, light emissions based on size of the particles and a high quantum yield making their use an attractive tool for different biomedicine and pharmaceutical purposes in the healthcare system. The main applications of QDs in healthcare systems includes- cancer disease diagnosis by medical imaging methods. It is helpful in drug delivery, gene therapy, precision medicine, toxicological research as well as pharmacological research. Their use is promising and will contribute towards a better understanding of biological systems.
Aim: The main aim behind this poster presentation would be to explore and identify all the different bio-applications associated with the usage of quantum dots in healthcare systems and to understand their potential use in therapeutics, disease diagnosis, drug delivery, bioimaging, etc.
Methods: Different research articles which have been published were studied to gather all the data related to the latest information as well as developments in the sector of quantum dots and how they can be used in the healthcare setting.
Some of the applications are listed down below- Bioimaging- when compared to the conventional luminescent dyes the use of quantum dots proves to be a better alternative for molecular imaging, biomolecule targeting, etc. Based on the shape, composition and size of the quantum dots they exhibit unique luminescence properties making their use possible in bioimaging.
Toxin detection- due to the optical properties possessed by the quantum dots, they could be used to detect drug overdose, pesticide poisoning, etc. and prove to be a new pathway into analytical toxicology.
Cancer diagnosis- the bio-conjugated quantum dots are helpful for identifying biomarkers when it comes to diagnosing cancer, the treatment as well as the prognosis. This technique could be used by surgeons for perfecting their surgeries, as the fluorescence provided by the QDs would help in mapping out the regions which are to be resected.
Results: Quantum dots are emerging to be a very promising tool in healthcare systems, which could be helpful in different areas. However, the one barrier which remains to be a hinderance is related to the toxicity of QDs.
Conclusion: QDs are a potential and powerful method which could be used in healthcare systems, their photo-optical properties have helped in drug targeted delivery which helps with precise targeted delivery of the drugs, bioimaging, diagnosis and other sectors. It has the potential to revolutionize patient care in an effective manner in the near future as further research continues.
Keywords: Quantum dots; biomedicine application; nanomedicine; bioimaging.

4. Revolutionizing Breast Cancer Treatment using CRISPR Optimized CAR-T Cell Therapy

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Background: Accounting for 12.5% of annual cancer cases worldwide, breast cancer affects 2.3 million women, making it the most common form of cancer globally and responsible for about 68,000 deaths yearly. Current treatment options for breast cancer are limited to surgery, radiation therapy, and medications including hormonal therapy or chemotherapy with a minimum 6% chance of recurrence of the disease and a decreased quality of life. Immunotherapy has achieved remarkable results but with its own limitations.

Aim: This review discusses the use of CRISPR technology to promote the proliferation and effectiveness of chimeric antigen receptor T (CAR-T) cell therapy as a novel treatment regime for breast cancer.

Concept: CAR-T cell therapy, a type of adoptive cell treatment, is a type of gene therapy where the T cells reprogrammed with artificial receptors are used for the recognition and targeted destruction of cancer tumors with specific antigens. When paired with CRISPR/Cas9 technology, the treatment showed improved cell function, persistence, and anti-tumor efficacy by genetic alteration to effectively recognize solid tumor antigens. Clustered regularly interspaced short palindromic repeats (CRISPR) associated protein-9 (Cas9) is a gene engineering technology that directs Cas proteins to specific DNA sites guided by a complementary RNA. CRISPR-enhanced CAR-T cell therapy prevents side effects such as cytokine release syndrome, making the T cells tumor-specific and reducing toxicity. Merging CAR delivery through lentivirus with Cas9 gRNA that targets endogenous PD-1 can result in inhibitory molecules resistant CAR-T cells. This emerging innovative genomic editing methodology can potentially overcome the limitations of CAR-T cell immunotherapy to target cancer genes and reduce not only the duration of the course of treatment but also save the patient from aggressive chemotherapy that severely deteriorates the quality of life with chances of recurrence. By combining the two technologies we can achieve personalized and effective treatments for patients battling hard-to-treat cancers, such as TNBC (triple-negative breast cancer).

Conclusion: In brief, the amalgamation of CAR-T cell therapy with novel gene editing technology of CRISPR/Cas9 has shown to be a stride forward in treating breast cancer. The inability of CAR-T cell therapy to act on specific targets in some cancers has become a major limitation. Hence, the incorporation of gene editing ensures versatility due to its higher specificity, precision, and tailored therapy with minimal risk that can be achieved over normal CAR-T cell therapy. Based on the available evidence, we review the advancements, limitations, and scope of combining two relatively new technologies that can improve breast cancer therapy.

Keywords: CRISPR, CAR-T Cell Therapy, Gene Editing, Breast Cancer

5. SUPERPARAMAGNETISM OF NANO PARTICLE

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ABSTRACT

The medical sciences have reflected nanotechnology's recent, rapid growth. SPIONs (Superparamagnetic Iron Oxide Nanoparticles) are a good illustration. SPIONs are used in Magnetic Resonance Imaging (MRI) and magnetic hyperthermia because of their superparamagnetic properties. SPIONs, unlike bulk iron, do not retain magnetization in the absence of an external magnetic field, allowing for precise remote control of their behaviour. As a result, they can be used as part of advanced drug delivery systems. SPIONs may be useful in a variety of medical fields due to their ease of synthesis, biocompatibility, multifunctionality, and ability to be further surface modified with different chemical agents. SPIONs do have certain drawbacks, such as their heavy macrophage absorption. Nonetheless, they appear to be very promising in oncological therapy (especially in brain, breast, prostate, and pancreatic tumours) based on ongoing studies. The primary aim of our presentation is to present the fundamental properties of SPIONs, address their current position in medicine, and study their applications in order to spur the creation of modern, improved SPION systems in the future.

Conclusion : It is one of the novel remote controlled drug delivery system under magnetic field. Various scale like control energy release for thermal therapy, therapy combined with other treatment such as chemotherapy (or) radiation.Further development of MNP's and these composite system, there are great expectation and promises for these remote controlled drug delivery system in future.

Keywords:MRI; magnetic hyperthermia; iron oxide; antibodies; toxicity; SPION

6. Topoisomerase Inhibitors in Cervical Cancer: A Review

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Abstract
Cervical cancer is a major global health issue, with over half a million women being diagnosed and over 300,000 deaths occurring each year. Topoisomerases are essential enzymes that maintain DNA structure and integrity during cellular processes like DNA replication, transcription, and recombination. Topoisomerase I and II inhibitors target these enzymes, disrupting transcription and replication, leading to DNA damage and cell death. Topoisomerase inhibitors target both normal and cancer cells but the impaired DNA repair mechanism and rapid cell division in cancer cells prevent the DNA repair mechanism from acting efficiently unlike the normal cells where the proofreading mechanism repairs the DNA damage. However, cancer cells develop resistance to single target-specific topoisomerase inhibitors over time, hence reducing their effectiveness. To overcome this challenge of single topoisomerase inhibitors, combination therapy is being studied that can lead to higher response rates, including tumour shrinkage or complete remission resulting in better outcomes for cervical cancer patients. So, this review provides a detailed account of all the Topoisomerase inhibitors studied to date that aim at targeting cervical cancer. We also report the possible combinations of topoisomerase inhibitors with other target-specific inhibitors such as HDAC inhibitors, DNA chelators, etc. Finally, we conclude with their pre-clinical to clinical translation status and their future perspectives in cervical cancer therapeutics.
Keywords: Topoisomerases, Anticancer activity, Combination therapy, Cervical cancer, Topoisomerase inhibitors.

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7. Biosensors: a catalyst for drug design break throughs

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Background: From the first discovery of biosensor, it had the potential to evolve and help in finding the most effective drug design within lesser time and more precision. A biosensor is a sophisticated analytical device that combines biological elements (such as enzymes, antibodies, or cells) with a transducer to detect and quantify specific molecules or biochemical reactions. These devices are designed to convert a biological response, like the binding of a target molecule to the biological element, into a measurable signal, often an electrical or optical one. Many biosensors are made for routine analysis, including clinical diagnosis, food quality control, in-process fermentation control, and environmental analysis. Numerous of these sensors are also appropriate for drug discovery screening. These devices make Real-time monitoring possible by providing susceptible and specific data essential for developing and designing new drugs. It has been demonstrated that biosensors can detect and analyse medications at extremely low concentrations. Over the past ten years, numerous optical biosensors based on surface plasma resonance, waveguides, and resonant mirrors have been used to study bimolecular interactions. These sensors can instantly ascertain the affinity and kinetics of a wide variety of chemical interactions without the need for a molecular tag or label. Due to improvements in instrumentation and experimental design, various biosensors are increasingly being used in a variety of drug discovery processes, such as target identification, ligand fishing, assay creation, lead selection, early ADME, and manufacturing quality control. Recent developments in tailored biosensors, such as surface plasmon resonance, fluorescent, photoelectrochemical, and electrochemical systems, are reviewed, with special attention paid to their mechanisms and uses in drug screening, efficacy assessment, and toxicity evaluation.

Aim and Method: To discuss and analyse how biosensor can be a tool in designing and developing precise and more effective drug.

Result and Conclusion: When developing and designing new medications, biosensors are a crucial tool. They support studies on pharmacokinetics and pharmacodynamics by providing real-time insights into molecular interactions that help validate targets. Biosensors significantly advance drug development by making personalized medicine and biomarker discovery possible. They become essential tools in contemporary pharmaceutical research due to their incorporation into high-throughput screening and AI-driven data analysis, which streamlines processes.

Keywords: Biosensors, Drug design, Optical biosensor, Surface Plasmon Resonance (SPR)

8. Unravelling the potential of Cannabidiol for diverse therapeutic applications

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Background: Cannabis, also known as Marijuana or Hemp, belonging to the family Cannabaceae, consists of a repertoire of phytochemicals, out of which cannabinoids have been studied the most. Cannabidiol (CBD) and Tetrahydrocannabinol (THC), are major Phytocannabinoids, of which, the former accounts for 40% of the cannabis extract and is not responsible for its psychoactive effects. Cannabidiol binds to a wide variety of pharmacological targets in the body and has shown promising results in diverse assortment of therapeutic indications as a potent anticonvulsant, analgesic, anti-inflammatory, neuroprotective and anxiolytic drug, amongst others. The first CBD-derived drug approved by the FDA, Epidiolex, for drug resistant epileptic seizures proved to be a safe treatment for many affected patients. Attributing to these results, research interest in CBD has been growing over the last two decades and has accelerated in the last five years.

Aim: The brief presented herein unravels what is known about Cannabidiol's varied therapeutic effects with emphasis on its mechanism of action and future perspectives for research.

Concept: Cannabinoids are further divided into Phytocannabinoids, Endocannabinoids and Synthetic Cannabinoids. The first group of cannabinoids identified were Phytocannabinoids, from the Cannabis sativa species, from which CBD and THC are the most notable ones. CBD is non-psychoactive and antagonizes the psychomimetic effects of THC; the major cannabinoid that causes psychotropic effects in cannabis. These properties of CBD, along with its therapeutic potential and safety profile, encouraged the substance for clinical trials. Currently, Cannabidiol is indicated in the treatment of seizures associated with Dravet and Lennox gastaut syndrome, neurological disorders such as - psychosis, anxiety, depression, Alzheimer's disease and to alleviate chronic pain and chemotherapy induced nausea. From a pharmacological perspective, cannabidiol's diverse receptor profile explains its potential application in such a wide variety of medical conditions.
The Phytocannabinoids exert their action through binding with the cannabinoid receptors, CB1 and CB2, part of the endocannabinoid system (ECS), present in the body. The CB2 receptors present in the immune tissues are particularly exciting targets of drug development because they don't cause the euphoria associated with cannabis, that stimulating the CB1 receptors does. It is a known antagonist that binds GPR55, the G-protein coupled receptor present in the caudate nucleus and putamen in the brain. Intracellular calcium release, PPAR-γ agonism and allosteric modulation of opioid receptors have been associated with CBD. Cannabidiol also acts as a partial agonist of 5HT1A receptors and may act as an anxiolytic, neuroprotective agent, and antidepressant.

Conclusion: In conclusion, Cannabidiol is an ideal drug candidate for the treatment of various therapeutic indications and several clinical trials of Cannabidiol-derived drugs are in progress for pain management, cancer treatment, autism and migraine. Cannabidiol could be the drug of choice for the treatment of unmet disease conditions. However, further studies are essential to fully explore the complete potential of Cannabidiol in humans.

Keywords: Cannabidiol, Tetrahydrocannabinol, Cannabis, Endocannabinoid system

9. Revolutionizing Drug Discovery: The Role of Artificial Intelligence in Accelerating Drug Development

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Background:

Drug discovery is a complex and time-consuming process, often taking many years and costing billions of dollars to bring a new drug to market. Traditionally, this process involves the identification of potential drug candidates, preclinical testing, clinical trials, and regulatory approval. However, the pharmaceutical industry faces significant challenges, such as a high rate of drug candidate failures and the increasing costs of research and development.

Artificial intelligence (AI) has emerged as a promising tool to revolutionize drug discovery. By leveraging AI techniques, such as machine learning, deep learning, and data analytics, researchers can analyze vast datasets, identify potential drug candidates, and predict their safety and efficacy, significantly speeding up the drug development process.

Aim:

The aim of this study is to explore the role of artificial intelligence in accelerating drug development. This research aims to assess how AI can streamline various stages of drug discovery, from target identification to clinical trial design, and examine the potential impact on the pharmaceutical industry.

Method:

1. Data Collection: We gathered a comprehensive dataset comprising molecular structures, biological assays, and clinical trial data.
2. Machine Learning Models: We developed machine learning models to predict drug-target interactions, drug-likeness, and adverse effects.
3. Virtual Screening: Virtual screening of compound libraries using AI algorithms to identify potential drug candidates.
4. Clinical Trial Optimization: AI-driven algorithms to optimize clinical trial designs, patient recruitment, and real-time monitoring.
5. Case Studies: We analyzed case studies of successful AI-driven drug discovery projects.

Results:

1. Improved Efficiency: AI-driven drug discovery significantly accelerated the identification of potential drug candidates, reducing the time and resources required.
2. Enhanced Accuracy: AI models improved the accuracy of predicting drug-target interactions and potential side effects.
3. Cost Reduction: The use of AI reduced the overall cost of drug development, making it more accessible.
4. Personalized Medicine: AI allowed for the development of personalized medicine approaches, tailoring treatments to individual patients.
5. Reduced Failure Rates: AI models helped in identifying potential issues in the early stages, reducing the rate of drug candidate failures.

Conclusion:

Artificial intelligence holds immense promise in transforming drug discovery. It streamlines the process, enhances efficiency, and reduces costs. The integration of AI into drug development pipelines has the potential to revolutionize the pharmaceutical industry, ultimately leading to the

faster delivery of novel, effective drugs to patients. However, ethical and regulatory considerations must be addressed to ensure the responsible and safe application of AI in drug discovery.
Keywords:
Artificial intelligence, drug discovery, machine learning, deep learning, virtual screening, clinical trials, drug development, personalized medicine, and cost reduction.

10. Regulations for AI-Powered Medical Imaging: Analyzing the gap

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Abstract:

The field of digital and information technologies used to manage and enhance healthcare delivery is known as "digital healthcare technology," or "digital health." It includes a range of techniques and technologies meant to improve the effectiveness, accessibility, and caliber of healthcare services. The following are some important elements and features of digital healthcare technology:

Electronic Health Records (EHRs), Telemedicine and Telehealth, Mobile Health (mHealth), Health Information Systems, Healthcare Analytics, Remote Patient Monitoring, Healthcare Apps and Portals, Artificial Intelligence (AI) and Machine Learning, Blockchain Technology etc.

AI (Artificial Intelligence) in medical imaging refers to the use of machine learning and deep learning algorithms to analyze and interpret medical images with a high degree of accuracy and efficiency. This technology has the potential to transform the field of medical imaging in several ways one of them is

Image Analysis and Interpretation: AI can analyze a wide range of medical images, including X-rays, CT scans, MRIs, ultrasounds, and pathology slides. It can identify abnormalities, tumors, fractures, and other medical conditions, often with a level of precision comparable to or even exceeding that of human radiologists and pathologists.

Now here Digital healthcare technology and AI medical imaging are closely interlinked and have the potential to revolutionize healthcare in several ways such as one of the ways is

AI Algorithms: Artificial intelligence algorithms, such as deep learning models, are at the core of AI medical imaging. These algorithms use digital healthcare data to detect and diagnose medical conditions from images. The more data available in digital form, the more effective these algorithms can become.

In summary, digital healthcare technology forms the foundation for AI medical imaging, providing the necessary infrastructure for data storage, accessibility, and management. AI, in turn, leverages this digital data to enhance medical imaging, improve diagnostic accuracy, and contribute to more efficient and personalized patient care. The synergy between digital healthcare and AI medical imaging has the potential to transform healthcare delivery and outcomes.

We will be discussing various case studies based on this and what are the various guidelines being given by the regulatory authorities and what are the challenges being faced by the use of this technology.

Keywords: Regulations, AI, Machine learning, Digital health technologies, medical imaging.

11. Advancements in Drug Delivery for Treatment of Guillain-Barré Syndrome

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Background: Guillain-Barré Syndrome (GBS) is a rare autoimmune disorder that can lead to severe paralysis and death.
Aim: The abstract summarizes recent advancements in treating GBS, highlighting critical insights from clinical trials and research studies.
Methods: Intravenous Immunoglobulin therapy (IVIG) has been a standard GBS treatment for many years. Recent studies, such as the one conducted by Hughes et al. in 2020, have reinforced its efficacy in reducing the severity and duration of GBS symptoms. Combination therapies involving IVIG and plasmapheresis have shown promising results in severe cases of GBS also known as the Zipper Therapy and currently the most preferred method of treatment.
Besides that, monoclonal antibodies, such as Eculizumab, have emerged as a potential game-changer in GBS treatment. Eculizumab, which inhibits complement activation, has shown significant promise in reducing disease progression and improving outcomes in GBS patients, as demonstrated by a study by Howard et al. in 2021. This novel approach targets the underlying immune response that triggers GBS.
In the fields of regenerative medicine, stem cell therapies have drawn attention. Studies by Kuitwaard et al. (2018) have explored the potential of mesenchymal stem cells in GBS treatment. These stem cells have shown an ability to modulate the immune system and promote nerve regeneration, offering new hope for patients.
Another avenue of exploration involves immunomodulatory agents like Fingolimod. This orally administered medication, primarily used to treat Multiple Sclerosis, has exhibited promising actions in GBS treatment by regulating the immune system. Research by Doets et al. in 2018 explored the safety and efficacy of Fingolimod in GBS patients, revealing positive outcomes.
Results: Moreover, advancements in supportive care have improved the overall management of GBS. Early diagnosis and multidisciplinary approaches, including physical and occupational therapy, have become integral components of GBS treatment, contributing to better long-term patient recovery prospects.
Conclusion: The treatment for Guillain-Barré Syndrome has evolved significantly, recent breakthroughs involving IVIG, monoclonal antibodies, stem cell therapies, and immunomodulatory agents offer new avenues for managing this condition. A multifaceted approach combining these therapies with early diagnosis and comprehensive supportive care provides hope for GBS patients, improving their chances of recovery and quality of life.
Keywords: Fingolimod; Zipper Therapy; Guillain-Barré Syndrome; monoclonal antibodies

12. Efficient pathways to drug discovery via clinical trial supply management

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Background: - Clinical trial supply management delivers the right medication to the right person on time. It holds the place during drug development from phase I up to approval. It supports clinical trial as key interface between clinical and technical world. Trial supplies are not only drugs but also test kits, laboratory equipment, gloves, gowns, masks, testing material etc.
Aim: - to understand the clinical trial supply management and challenges faced during clinical trial.
What we do? Clinical supply chain management (SCM) is involved in forecasting the demand of drugs, number of treatment groups, number of sites & study design. The demand planning is done from the API till a finished product. Further, execution of proper packaging, labelling & distribution strategy is developed. Between planning and execution, the data about the drug from the discovery, production, analytical testing, manufacturing & storage are collected, validated, governed & generated on a common platform so that data will be available for each & every manufacturing plant.
Challenges :- The challenges faced during SCM are criticality in delivery of drug with short shelf life; criticality in delivery of cell & gene therapy drug, radioligand drug; prevention of trial drug stock out; regulatory compliance issue; right first time data collection & generation; decrease patient visit & increased market time; increased clinical trial.
Solutions :- The following strategies and tools will help to improve trial SCM- strong network of internal & external facilities, a harmonized system for all the customers & vendors, reducing deviations in clinical labelling, using better tools to do forecasting & planning, increasing the right first time of data using master data governance, continuous monitoring of trial, trending study to meet study demand, careful vetting of label texts, temperature managed supply chain of sensitive products like biologics, cold chain distribution etc.
Conclusion: - By ensuring & implementing meticulous protocols, Pharma Company can ensure safe, efficient handling of investigational products. A well-executed supply process needs careful forecasting, planning, seamless distribution & networking. A well executed clinical trial supply management not only safeguards patient safety but can also ensure quality clinical trial data.

13. Innovative Natural Remedy for Upper Respiratory Tract Infections: A Dispersible Tablet Approach

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Introduction

Upper respiratory tract infections (URTIs) are a widespread health concern, affecting the upper respiratory system, which includes the nose, sinuses, pharynx, larynx, and trachea. URTIs are commonly caused by viral or bacterial pathogens, resulting in symptoms such as nasal congestion, sore throat, cough, and general discomfort. Current treatments for URTIs predominantly rely on antibiotics, which are associated with growing concerns about antibiotic resistance, side effects, and the need for alternative therapeutic approaches.

The Potential of Natural Remedies

Natural remedies derived from traditional medicinal plants have demonstrated promise in the management of URTIs. Medicinal plants like Tulsi (Ocimum sanctum), Turmeric (Curcuma longa), and Neem (Azadirachta indica) have been recognized for their therapeutic properties. Tulsi exhibits immunomodulatory and anti-inflammatory effects, turmeric is rich in antioxidants, and neem possesses potent antimicrobial features. These natural ingredients have been utilized for centuries in various forms to combat a range of ailments, including respiratory infections.

Challenges in Natural Remedy Administration

While the potential of natural remedies is acknowledged, their effective use has been hampered by inconsistent delivery methods and dosing. Traditional preparations often require the consumption of teas, infusions, or capsules, which may not be suitable for all individuals, particularly children and the elderly. This variability in administration methods can lead to inconsistent treatment outcomes.

The Innovative Dispersible Tablet Approach

Our concept introduces a novel approach to URTI management—a dispersible tablet that combines the therapeutic properties of tulsi, turmeric, and neem. This dispersible tablet offers several advantages:

a. ***Standardized Dosage:*** The tablet ensures a consistent and standardized dosage of these natural ingredients, eliminating the guesswork associated with traditional remedies.

b. ***Ease of Administration:*** The dispersible tablet form is easy to consume and suitable for individuals of all age groups, including children and the elderly. It can be dissolved in hot water, transforming into an inhalant, making it convenient for those who have difficulty swallowing traditional tablets or capsules.

c. ***Synergistic Action:*** The unique combination of tulsi, turmeric, and neem is designed to work synergistically, addressing multiple aspects of URTIs. Tulsi's immunomodulatory properties boost the immune response, turmeric's antioxidants combat oxidative stress, and neem's antimicrobial features help fight the underlying pathogens.

Promoting Patient Compliance and Antibiotic Reduction

This innovative formulation aims to enhance patient compliance by offering a convenient and effective alternative to antibiotics and traditional herbal remedies with inconsistent dosing. By reducing the misuse of antibiotics, this approach contributes to the global effort to combat antibiotic resistance, a growing concern in healthcare.

Conclusion : In conclusion, the dispersible tablet approach that combines tulsi, turmeric, and neem offers a promising alternative for the management of URTIs. When added to hot water, the tablet transforms into an inhalant, allowing for the inhalation of the aromatic ingredients. While further research is necessary to validate its efficacy, this innovative formulation highlights the significant role that traditional medicinal plants can play in modern healthcare. It addresses the limitations of current URTI treatments and holds the potential to improve patient outcomes by promoting compliance and reducing the inappropriate use of antibiotics. This concept underscores the importance of translational research in drug development, where traditional remedies are harnessed and advanced to meet the healthcare needs of the modern world.
Keywords: URTI Management; Dispersible Tablet; Natural Remedies; Inhalant Therapy

14. Artificial Intelligence: A Paradigm Shift in Antibiotic Discovery

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In today's world, growing antibiotic resistance has been a major concern for the healthcare sector. In 2019, antibiotic resistance infections claimed 1.3 million lives and is estimated to be 10 million by 2050. The financial burden on healthcare providers is substantial, with an extra $20 million in annual expenses and 11 million additional hospital days attributed to antibiotic-resistant infections.

The demand for new antibiotics is rising as more pathogens develop resistance towards existing antibiotics but the world's demand can't be addressed by the protracted old techniques of development. Thus it is imperative that a new, rapid, and efficient approach to antibiotic resistance be developed which can be achieved through Artificial Intelligence (AI).

Recent research related to AI has streamlined clinical trials, improved drug safety monitoring, managed vast healthcare datasets, and enhanced drug manufacturing and delivery. AI techniques like Deep Search, GT4SD, ST4SD, and RXN have been successfully employed in antibiotic discovery, yielding promising results such as a drug against *Acinetobacter baumannii*. Not just limited to the development of new molecules, AI can be used to identify novel antibiotic peptide sequences which is being done through a recently developed computational method known as Controlled Latent attribute Space Sampling (CLaSS).

The integration of AI into the pharmaceutical industry holds the promise of bringing new and more effective treatments to patients, reducing costs, and improving the efficiency of drug development and healthcare systems. However, it also comes with regulatory and ethical challenges that need to be carefully addressed to ensure patient safety and privacy. This review offers an extensive overview of contemporary AI-driven technologies employed in the discovery of antibiotics and its benefits over conventional approaches.

Keywords - automated antibiotic discovery, artificial intelligence, machine learning, deep learning

15. Digitalis glycoside as an inhibitor of Hypoxia inducible factor-1alpha: A conceptual approach in the treatment of cancer

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Background: Cancer is a disease that is challenging to treat. The tumors become drug resistant making the therapy more difficult and finding new targets that will negatively affect the disease progression becomes very important. Hypoxia inducible factor-1 alpha (HIF-1alpha) is one such target that if manipulated with the right drugs can show promising outcomes and new scope of treatment in cancer.

The oxygen-dependent transcription activator, HIF-1alpha is associated with the survival of the cells during hypoxic conditions. In normoxic conditions, the levels of HIF-1alpha are maintained low through proteasomal degradation by prolyl 4-hydroxylase domain protein 3 (PHD3), a cellular oxygen sensor. Increased patient mortality in human malignancies of the bladder, brain, breast, cervix, colon, endometrial, lung, oropharynx, pancreas, skin, and stomach is linked to HIF-1alpha overexpression in tumour samples. Cancer cells tend to grow rapidly and once they reach a sufficiently large size, the environment around these cells becomes hypoxic. During hypoxic condition, the levels of PHD3 decreases causing increased expression of the HIF-1alpha that leads to transcription of various factors like erythropoietin (EPO), vascular endothelial growth factor (VEGF), heme oxygenase-1 (HO-1), adrenomedullin (ADM), glucose transporter-1 (Glut-1), that is responsible for angiogenesis and tumor survival and growth and prevents tumor cell apoptosis.

One such drug that inhibits this target is digitalis glycosides. Digitalis contains two important constituents digitoxin and digoxin which are currently used in the treatment of heart failure by targeting the sodium-potassium ATPase pump. Docking studies conducted have shown HIF-1alpha to be inhibited by digitalis glycosides.

Aim: This concept provides a novel approach to the treatment of cancer.

Methods: In-vitro analyses are conducted using cancer cell lines and expression levels of HIF-1alpha, VEGF, and apoptosis markers were assessed. In-vivo studies were conducted by infecting nude mice with tumor xenograft and tumor volume was measured along with HIF-1alpha levels in the tumor cells.

Results: The in-vitro and in-vivo studies show that digitalis glycosides are capable of inhibiting the HIF-1alpha levels and inhibiting cancer cell proliferation, and migration, promoting apoptosis, and reduction in tumor size as well

Conclusion: It may be possible to use digitalis glycosides for cancer therapy in the future.

Keywords: Cancer, Hypoxia inducible factor-1alpha, digoxin, digitoxin

16. Next-Generation Cell-Based Therapies to Combat Metastatic Brain Tumor

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Background: Brain cancer is the leading cause of death worldwide. Around, 18 million new cases have been identified annually, leading to 10 million deaths globally. Patients with advanced brain tumor-like glioblastoma (GBM) have a shorter survival period. GBM is a grade IV aggressive type of brain tumor that leads to rapid proliferation and growth rate. The mean survival period is 14 to 16 months following diagnosis and the progression-free survival rate (PFS) is 7 to 10 months. Therapies such as radiation, surgical abscission, and chemotherapy do not show curable results due to the development of resistance and a profusion of side effects in the treatment of an advanced brain tumor.
Aim: This review discusses the use of upcoming cell-based therapies to treat GBM such as Receptor-Based Therapy, Stem cell-based Therapy, Molecular Mechanism of miRNA, and Oncolytic Virotherapy (OVT).
Concept: Oncolytic virus (OV) is a genetically engineered non-virulent virus that replicates and targets cancer cells without harming healthy tissues. OVT helps to suppress the immune system in the tumor microenvironment and promotes a strong immune cell response against glioma cells. Under OVT Adenovirus Delta-24-RGD, Mesenchymal stem cell-armed Herpes Simplex Virus (MSC-HSV), and New Castle disease virus (NDV) are some of the methods explored.
MicroRNA (miR) are small endogenous non-coding RNA that contains approximately 22–24 nucleotides which repress the gene expression through binding into the 3′-untranslated region (3'UTR) and inhibit or degrade the specific messenger RNA (mRNA) strand and cause inhibition of the translation process.
Numerous receptors have been identified to target and destroy GBM cells by triggering death receptor (DR5) via tumor necrosis factor-related apoptosis-induced ligand (TRAIL) stimulating the apoptosis signalling pathway and the mitochondria-mediated pathway including activation of caspase 3/8 resulting in the advancement of tumor cell death with high efficacy and low toxicity. The typical epidermal growth factor receptor (EGFR) nanobody and TRAIL combination blocks the EGFR signalling pathway and promotes the DR5 clustering, activating the caspase-mediated apoptotic tumor cell death.
Stem Cells play a potential role in the GBM Treatment. Stem cells (SC) are specialized cells that have the potential to develop various types of cells in the body. Various application of stem cells for GBM treatment includes using MSC to inhibit tumor cell growth by releasing TRAIL and Neural precursor cells (NSC) to alleviate tumor growth.
Conclusion: Cell-based therapy to combat metastatic brain tumors has been proven to have more advantages as compared to existing therapies which have failed to treat the disease and did not improve the survival rate of the patient due to high resistance and drug tolerance. These novel therapies that will be further explored have proven to be an upcoming potential alternative to completely destroy cancer cells and are currently undergoing clinical studies.
Keywords: Anti-tumor · Glioblastoma · Brain tumor · Genetic mutation · Metastasis

17. Thinking Outside the Box: Non-Canonical Targets in Multiple Sclerosis

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Background: Multiple sclerosis (MS) is an immune-mediated disease of the central nervous system that causes demyelination, axonal degeneration and astrogliosis , resulting in progressive neurological disability. The aetiology of the disease remain elusive but a large body of evidence suggest that it is immune -mediated in nature. Globally, some 2.8 million people are affected and its incidence and prevalence have been on the rise world wide over the past few decades .Fuelled by an evolving understanding of MS immunopathogenesis, the range of available immunotherapies for clinical use has expanded over the past few decades.
However, MS remains an incurable disease even targeted immunotherapies often fail to control insidious disease progression, including the need for new and exceptional therapeutic option beyond the established immunological landscape.
Aim: The brief presented herein discuss about the non -canonical targets in the treatment of multiple sclerosis, which mainly focus on few highly promising areas, recent finding in these areas may guide the field towards novel target for future therapeutic approaches in MS
Concept: The major non -canonical target sites for MS are oligodendrocytes; the blood brain barrier ; the coagulation system; metabolites and cellular metabolism.
Oligodendrocytes, are specialized gial cells that synthesize myelin sheaths ,enable saltatory conduction and provide metabolic support to neurons .Inflammation regularly damages oligodendrocytes, resulting in demyelination and , consequently ,axonal loss. To effect remyelination, microgila and macrophage must first clear the damaged myelin, a process that is enhanced by activation of the triggering receptor expressed on myeloid cells (TREM). Next ,oligodendrocyte precursor cells (OPC) need to be recruited to the zone of myelin loss and undergo further differentiation and maturation to become fully competent myelin producing oligodendrocytes .
The BBB consist of specialized endothelial cells (EC) which communicate with other cells including astrocytes, neurons other smooth muscles and immune cells of the CNS to form the neuro vascular unit. The breakdown of the BBB is an early hallmark and key pathophysiological event in MS. Different pathway have been identified that control the morphology and adhesive capacity of EC. For example, the Kallikrein-kinin system regulates
the expression of VCAM1 and intercellular cell adhesion molecule 1 (ICAM1) on brain via PAR2 receptor mediated pathway. Further unexpected target might also be involved in the regulation of adhesive capacity, given that the potassium channel TREK1 was shown to modulate VCAM1 and ICAM1 expression on brain EC.
Conclusion: Remarkable progress has been made in our understanding of MS , moreover a deeper understanding of the process leading to neuronal and axonal degeneration would benefit the treatment of MS. In conclusion, innovative MS therapies may combine strategies of promoting immunomodulation, fostering remyelination and providing neuroprotection ,and future trails should purse such a multifaceted approach to improve the long term prognosis for this crippling disease.

18. Recent advancement and treatment in alcholic liver disease

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Objective: The main objective of this study was to analyse and determine the recent advancement and treatment in alcoholic liver disease.
Methods: Below mentioned column in report will describe about the difference in herbal medicines and conventional drugs used to treat alcoholic liver disease. This column differentiates parameters like biochemical factors and histopathological factors by taking two examples of drugs for each that is herbal and conventional drugs Biochemical factors includes AST, ALT and bilirubin. The below column indicates clear difference in natural and conventional drugs graphically too.
Result: Treatment such as performing liver function test and liver biopsy we could analyse the biochemical and histological factors of person suffering from alcoholic liver disease. Other than this, providing herbal medications and allopathic drugs we could treat ALD. The severe stage of liver diseases is cirrhosis. Certain surgeries has been carried out such as liver transplant for treating cirrhosis which would only be option for chronic stage of liver. Medications that is herbal drugs and allopathic drugs are been given to treat the early stages of alcoholic liver diseases. Hence, herbal drugs show greater extent of lipid metabolism than compared to allopathic drugs
Conclusion: Herbal drugs show greater therapeutic effect and have more efficacy than allopathic drugs.
Key words: Alcoholic liver disease (ALD), Alkaline phosphate (ALP), Alanine transaminase (ALT), Aspartate transaminase (AST).

19. Pharmacological Strategies for Targeting HSP70 in Glioblastoma Multiforme: Nanomedicine Advancements and Beyond

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Background: In the treatment of Glioblastoma multiforme (GBM) , conventional therapeutic approaches often encounter significant barriers, including the blood-brain barrier (BBB), tumor heterogeneity, and resistance. As such, innovative strategies are urgently needed to enhance diagnostic and treatment outcomes in treating GBM.
Aim: This article explores the potential of harnessing Heat Shock Protein 70 (HSP70) and utilizing nanomedicine techniques to enhance therapeutic strategies for GBM treatment, ultimately improving treatment outcomes for this challenging brain tumor.
Methods: Recent research endeavors have delved into harnessing the distinctive attributes of HSP70 to combat the formidable challenges GBM presents. HSP70, conspicuously overexpressed in GBM, has garnered considerable attention as both a valuable biomarker and an enticing therapeutic target. It orchestrates critical functions, including protein folding, degradation, prevention of protein aggregation, and transportation across membranes, fostering cellular survival under stress. This multi-faceted nature of HSP70 has paved the way for exploring diverse avenues to intervene in the progression of GBM, reflecting the depth and breadth of pharmacological research in this domain.
Results: Nanoparticles, including superparamagnetic iron oxide nanoparticles (SPIONs), gold nanoparticles, silver nanoparticles, micelles, liposomes, cadmium selenide quantum dots, and dendrimers, have been utilized to deliver drugs and diagnostic agents specifically to GBM. Functionalized with HSP70-specific ligands, these nanoparticles enable precise targeting, enhanced drug accumulation, and controlled release, potentially revolutionizing GBM therapy.
Conclusion: Integrating HSP70 into GBM therapy, in conjunction with a spectrum of treatment modalities, presents a versatile and promising approach to ameliorate GBM prognosis and treatment efficacy. By incorporating HSP70-targeted therapies with techniques such as photothermal therapy, chemo-phototherapy, chemodynamic therapy, sonodynamic therapy (SDT), immuno-phototherapy, radiation therapy, drug delivery, gene therapy, and advanced imaging technologies, the multifaceted challenges posed by GBM can be effectively addressed. This innovative strategy shows significant potential in transforming the GBM treatment landscape, offering newfound optimism to patients grappling with this formidable disease.
Keywords: Glioblastoma multiforme (GBM), Heat Shock Protein 70 (HSP70), Nanoparticles, Therapeutic Strategies

Poster Presentations

Stream 2: Drug Design and Synthesis

1. Synthesis, Characterization and Pharmacological Evaluation of 1,3,4-Thiadiazole Bearing Pyrimidine Derivative as Stat 3 Inhibitor For Treatment Of Breast Cancer

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ABSTRACT

BACKGROUND: In 2018, cancer was the second leading cause of death worldwide. Breast cancer, the most prevalent type of cancer, accounting for 25% of female cancer cases and 12% of new cancer cases globally, ranking it as the second-leading cause of cancer-related fatalities. There are four types of breast cancer, according to the receptors: triple negative, HER-2 overexpressing, luminal A, and luminal B. STAT3, one of the seven STAT proteins, controls important genes and is one of the essential players in the development of cancer. In cancer, the IL-6/JAK pathway is frequently disturbed, which causes STAT3 activation and promotes tumor development, especially in TNBC. Thiadiazole is of interest as a potential anticancer drug due to its distinctive chemical structure and promise in silico STAT3 SH2 domain activity. The purpose of this study is to assess the potential of thiadiazole-based pyrimidine derivatives.

AIM: The aim of this project is to synthesized, characterise and evaluate 1,3,4- thiadiazole bearing pyrimidine derivative as STAT3 inhibitor for the treatment of breast cancer.

METHODS: INSILICO: Ten diverse aromatic aldehyde compounds were optimized and docked into STAT3 homodimer's crystal structure (PDB ID: 4ZIA) using LibDock. Results were saved in m012 format, and in Discovery Studio, hydrogen bonds were added. CDOCKER and interaction energy were computed for each pose. Animals with measurable tumors were grouped (5 groups of 6 each). Groups 1 and 2 got control substances, while Group 3 received Bendamustine (70mg/kg p.o). Groups 4 and 5 were given the test compound (15mg/kg and 30mg/kg). Tumor volume was measured weekly using Vernier callipers and calculated using the ellipsoid. IN VITRO: MDA-MB231 (TNBC) cell lines (ATCC) were cultured in DMEM supplemented with 10% FBS, 100U/mL penicillin, and 100µg/mL streptomycin. Cells were maintained at 37°C with 5% CO2.

RESULTS: Among the synthesized molecule D and E have shown very good result of invitro anticancer activity against MDA-MB 231 cell line. CTC50 value of compound D is 54.12 and compound E is 45.438.

CONCLUSION: In this study, we synthesized and assessed 1, 3, 4-Thiadiazole-bearing pyrimidine derivatives for their anticancer activity through in silico, in vitro, and in vivo evaluations. One of these compounds exhibited notable activity in in vitro assays, suggesting that Compound E holds promise for breast cancer therapy.

KEYWORDS: STAT3, Breast cancer, Thiadiazole

2. In silico identification of potential antiviral agents against mutated Marburg Virus VP35

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Background:
Marburg Virus Disease (MVD) is a severe, acute, and rarely occurring human disease which is caused by the Marburg virus (MARV), that belongs to the same family as of Ebola virus and with an average case fatality rate of 50%. It has shown increased frequency of outbreaks recently. Currently no specific treatment exists for this disease. Among the various targets, the Viral Protein 35 (VP35) is reported to be an amenable target to exert antiviral actions.

Aim
To carry out *in silico* identification of potential antiviral agents against Marburg virus VP35.

Methods:

- Unmutated oligomerization domain of MARV VP35 Protein was retrieved from PDB.
- On the binding site of oligomerization domain of MARV VP35, which was identified by CASTp server, deleterious mutations were predicted using the SIFT and PolyPhen-2 servers.
- In silico mutation on the active site of the protein was carried out by Alanine scanning mutagenesis using SeeSAR 12.0 software.
- Mutated protein structure was evaluated using Ramachandran plot through PROCHECK and MolProbity server.
- List of US FDA approved antiviral drugs from US FDA Official website and available literature was made.
- Molecular docking studies of the listed drugs against the mutated protein was carried out using SeeSAR 12.0 software.

Results:
Mutation of Valine at 110th position of active site of the protein by Alanine, was found to deleterious and the mutated protein was found to be stable. Among the 53 drugs used for docking studies, five of them (Didanosine, Lamivudine, Ribavirin, Foscarnet sodium and Valganciclovir hydrochloride) were observed to be showing good docking score and among them Ribavirin showed the highest score of -14.34.

Conclusion:
Ribavirin was identified as the most suitable FDA approved antiviral agent against MARV VP35 for treating Marburg Virus Disease.

Keywords: Marburg Virus Disease, VP35, Oligomerization domain, Deleterious mutation.

3. Molecular Docking and Dynamics Guided Drug Repurposing for Triple Negative Breast Cancer Targeting PARP Receptor: A Computational Approach

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Abstract

Background:

Triple negative breast cancer (TNBC) is the aggressive subtype of breast cancer distinguished by the absence of protein expression of hormone receptors. Patients show low survival rates due to the poor prognosis of the disease. BRCA1 mutations causing faulty DNA repair leads to TNBC. Poly-ADP ribose polymerase (PARP) is a protein which is involved in damage recognition, repairing single strand breaks and carrying out the DNA base excision repair in normal cells. PARP is chosen as a target receptor due to studies showing its inhibition causing decrease in tumor growth with minimal side effects.

Aims: Screening and identification of molecules from FDA approved drugs, which can bind to the PARP receptor leading to its inhibition for possible use as antiTNBC agents.

Methods:

The protein structure present in the catalytic domain of PARP2 forming a complex with Olaparib (PDB: 4TVJ) was acquired and prepared from Schrodinger Suite. The ligands were obtained from FDA approved drugs (downloaded from Zinc15 database). Molecular docking was conducted using HTVS, SP and XP modes and the parameters like dock scores and protein-ligand interactions were determined. Prediction of ADME properties and Prime MM-GBSA studies for calculating free binding energy were carried out. Best molecules were subjected to Induced Fit Docking, and Molecular Dynamics studies using Desmond module in Schrodinger to analyse the interactions in biological systems.

Results:

The top ten compounds were selected based on XP dock score and free binding energy and were subjected to Induced fit docking. Based on the IFD studies best two molecules were selected and subjected to Molecular dynamics studies. The top two compounds ZINC000004098633 (Polydatin) and ZINC000000518554 (Arbutin) obtained after the computational screening and analysis has depicted successful binding abilities to PARP receptor.

Conclusion:

Studies reveal that Polydatin and Arbutin can be further explored for their in vitro PARP inhibition and antiTNBC studies for development as PARP inhibitors for treating TNBC.

Key Words:

Triple Negative Breast Cancer, PARP inhibitors, molecular docking, molecular dynamics

4. In Silico Screening Of The Selected Heterocyclic Moieties Targeting Sirt3 Against Parkinson's Disease

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ABSTRACT

Background: Parkinsonism, a degenerative neurological condition that affects muscle movement, Most commonly affects geriatric patients. 1 out of 100 individuals over the age of 65 is affected by PD. In mitochondria, sirtuin-3 (SIRT3) is an NAD+-dependent protein deacetylase that controls mitochondrial proteins and upholds the antioxidant status of the cell. ➢ SIRT3 has been linked to a growing body of degenerative diseases, including Parkinson's disease (PD), a terrible condition of the nervous system for which there are presently no cures.

Aim: The present study is aimed to find the potent SIRT3 activator from the various homologous group of compounds against Parkinson's disease by in silico approaches.

Method: In the study, we conduct in silico studies for phenyl based heterocyclic moieties targeting Sirtuin-3 and 3D-QSAR studies using "Atom based QSAR" module of Schrödinger suite-2021-4. To conduct Molecular Dynamic studies for the active compounds using desmond module in Schrodinger suite-2022-22 to find computer simulation method for studying atoms and molecules physical motions. The ligands were screened against the target 4FVT which was obtained from the protein data bank. More than 300 ligands were screened against the protein, among those 300 compounds Seven compounds have shown the highest binding score than the standard drug (Resveratrol). The docking, MMGBSA, and ADMET were done. The molecular dynamic study was done using Schrodinger software. A molecular dynamic study was carried out for lead compounds and was found to be potential.

Conclusion: The phenyl-based heterocyclic derivative IMPHY000226 was found to have the highest binding score and it has a good molecular dynamic result. This work has suggested that the Compound IMPHY000226 can be taken up for further studies against Parkinson's disease.

Keywords: Parkinson's Disease, Molecular docking, Sirtuin-3, 3D-QSAR.

5. Identification Of New Chemical Entities As Hif-1a Stabilizers For Diabetic Wound Healing

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ABSTRACT

Background: Diabetes is a kind of endocrine disease that impacts around 6% of the world's population. In worldwide 68% of amputations were performed in persons with diabetes. Hypoxia-inducible factor 1- alpha (HIF-1A) is a crucial regulator of wound healing in diabetic patients, which includes epithelialization, angiogenesis, granulation, tissue development, and wound contraction. Even though diabetic wounds are hypoxic, HIF-1A levels are decreased during diabetic conditions.
Aim: The aim of our project is to identify potential HIF-1A stabilizers for the treatment of diabetic wound, because it is estimated that up to 25% of individuals with diabetes will develop a foot ulcer in their lifetime.
Method: Research articles and scientific literature on diabetic wound and importance of HIF-1A target for its treatment were gathered and structures of the reported HIF-1A stabilized were collected. Pharmacophore based on the collected 2D structures of reported HIF-1A Stabilizer were generated using PharmaGist online tool. Compounds were identified based on the pharmacophore, by virtual screening using ZINCPharmer online tool. Molecular docking was performed using PyRx and ADME studies by SwissADME and Toxicity study by PreADMET was also performed.
Conclusion: Our proposed hypothesis is to increase HIF-1A levels by inhibiting VHL and HIF-1A interactions by small bioactive molecules, accelerating diabetic wound healing. Three features (Two hydrogen bond acceptors and One hydrogen bond donor) pharmacophore model was generated from the existing HIF-1A modulators. Virtual screening was done based on the generated pharmacophore, and a library of 700 compounds was selected using ZINCPharmer. Based on the docking analysis the Top 15 HITs were selected and after performing ADMET studies the Top 2 HITs (ZINC04214700 & ZINC12529886) were identified as potential HIF-1A stabilizers. From this finding, we demonstrated that inhibiting the VHL and HIF-1A connection is a promising strategy for treating diabetic wounds.
Keywords: Diabetic wound, HIF-1A, VHL, PPI, Pharmacophore, Virtual screening, Docking, ADMET.

6. Design and synthesis of novel diphenyl ether derivatives and their Anti-tubercular activity.

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Abstract: About 1.6 million deaths due to Tuberculosis (TB) in 2021 worldwide, made it 13th leading cause of death and the second leading infectious killer after COVID-19 (above HIV and AIDS). Diphenyl ether derivatives inhibit mycobacterial cell wall synthesis by inhibiting an enzyme called enoyl-acyl carrier protein reductase (InhA), which catalyses the final step in the *Mycobacterium* fatty acid synthesis cycle. In pursuit of developing direct inhibitors of InhA, a series of novel diphenyl ether derivatives were synthesised and tested for antitubercular activity against *Mycobacterium tuberculosis* H37Rv. Synthesised derivatives were tested for cytotoxicity using various cell lines and found to be safe. Compound AN-3 exhibited 92.89% inhibition of *Mycobacterium bovis* at 10 µM in a primary screening. Compound AN-6 showed inhibitory activity of 4.7-6.25 µM in (7H9/glucose/casitone/Tx) media. The biological activity of the compounds was also corroborated by molecular modelling studies. Furthermore, *in silico* results revealed that all of the tested compounds exhibited good ADME properties and drug likeness, indicating that they could be considered as potential candidates for further drug development.

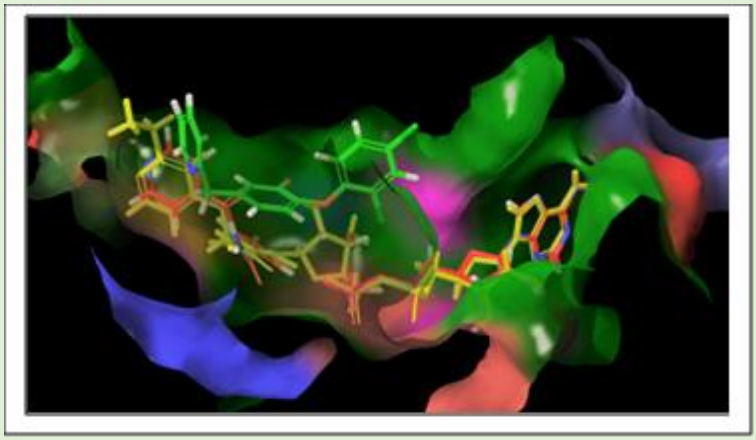

Figure 1

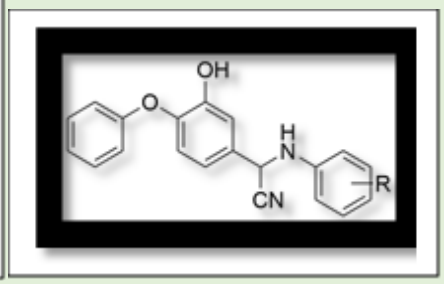

Figure 2

Fig 1: Active site of InhA showing diphenyl ether derivative and other potent molecules
Fig 2: Structure of representative molecule

7. In-silico Design of Host Cell Derived Anionic Peptide Targeting HSV-2 Entry

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Abstract

Background: In 2016, an estimated 491 million individuals aged 15-49 globally were affected by genital herpes caused by HSV-2, representing around 13% of this age group's population. HSV-2 exhibits a higher incidence rate in women compared to men due to the greater efficiency of sexual transmission from men to women. Prevalence rises with advancing age, although the greatest incidence of new infections occurs among adolescents. Resistance to the existing anti-HSV drugs has become a major concern. As a result, novel strategies are needed to curb HSV-2 infection. Interaction between HSV glycoproteins (gB, gD, and gH/gL) and host cell receptors (nectin-1, 3-OS-HS, HVEM) regulate HSV entry. The binding of HSV-2 gD to its primary receptor nectin-1 triggers the gH/gL and gB-driven fusion cascade. Thus, gD/nectin interaction is a new avenue to target the HSV entry. To date, there have been no attempts to utilize a peptide derived from nectin-1 to inhibit the entry of HSV-2. Electrostatic interaction plays an important role in negatively charged host cell interaction with the basic residues of viral glycoproteins. In this study, we have developed an anionic peptide from nectin-1 that binds to HSV-2 gD to block virus entry into the cell.

Methods: An anionic peptide was designed using a region of the cytoplasmic domain of nectin-1 that contains amino acid residues with a high negative charge. The physicochemical properties and secondary structure of the peptide were evaluated by the ProtPram and PEP FOLD-3 server. Peptide/HSV-2 gD protein docking was performed by the ClusPro server. The stability of the interactions was analyzed by the MD simulation study (Desmond).

Results: The docking study revealed that the 20-mer peptide H1 (residues 421-440) (net charge: -6; sequence: DSDDEKKAGPLGGSSYEEEE) exhibited interaction with the patches of HSV-2 gD that bind to nectin-1. Furthermore, these critical interactions remained stable throughout the entire MD simulation. A 20-mer peptide H1 exhibited a strong interaction with the critical residues Gln132, Arg134, and Asp215 of the HSV-2 gD glycoprotein.

Conclusion: In-silico results showed the strong interaction of the 20-mer peptide H1 with HSV-2 gD glycoprotein. These peptides have the potential to disrupt the interaction between HSV-2 gD and nectin-1, thereby preventing the entry of the virus into host cells. The confirmation of the anti-HSV-2 potential of 20-mer peptide H1 can be achieved through the synthesis and testing of its antiviral activity.

Keywords: Genital herpes infection, antiviral peptide, HSV-2 entry

8. Amentoflavone an unmapped bioactive from *Garcinia indica* Choisy source sheltering therapeutic properties for treating olanzapine- induced cardiotoxicity and other metabolic disorders

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Abstract

Background: Cardiometabolic problems are common in schizophrenia and have been linked to significant morbidity and death when treated with olanzapine. Amentoflavone, a bioactive in *G. indica* Choisy fruit, has anti-diabetic, cardioprotective, and anti-obesity properties and is used in phytopharmaceuticals, although its mechanism of action is unknown.

Aims: To investigate the mechanism of actions of *G. indica* Choisy bioactives as cardioprotective and against other metabolic diseases in olanzapine-induced cardiotoxicity.

Methods: Literature reported *G. indica* Choisy bioactives were collected. SuperPred DB predicted bioactives and Gene Cards DB predicted olanzapine targets ($p>0.7$). Cytoscape created the Bioactives-Targets-Pathways and Olanzapine-Targets-Pathways network. The molecular docking for potential therapeutic protein targets and modulated bioactives was followed by 100-ns MD run to determine structure stability.

Results: Olanzapine modulated fifty targets; enrichment analysis identified fourteen pathways related to cardiotoxicity. While twenty-six compounds targeting fourteen protein molecules were found to be involved in twelve pathways associated with diabetes mellitus, hypertension, obesity, and cardiovascular diseases pathways. Gene set enrichment reveals that amentoflavone is highly modulated bioactive and has notable significance to modulate *IGFR1, PPAR-g* and, *GAA* protein targets within the network. Calcium and PI3K-AKT signaling pathways were predicted as major involved pathways. Amentoflavone also had the highest number of intermolecular interactions and lowest binding energy with *IGF-1R* (-9.7 kJ/mol), *GAA* (-9.9 kJ/mol), and *PPAR-g* (-8.6 kJ/mol) during a 100 ns MD projection run.

Conclusion: *G. indica* bioactive amentoflavone works *via* several proteins and multiple pathways to prevent the cardiotoxicity and metabolic disorders caused by olanzapine. Furthermore, experimental studies (either in cell lines or animal models) are essential to validate the potential of the amentoflavone bioactive is required.

Keywords: Olanzapine, *Garcinia indica*, Traditional medicine, Cardiovascular disorder.

9. Pharmacoinformatic analysis revealed the therapeutic properties of *Crocus sativus* in male infertility

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Abstract

Background: The "Male Factor" sometimes known as male infertility (MI) is defined as a change in sperm contraction, motility or shape, estimated around 12% worldwide. *Crocus sativa*, a well-known medicinal plant is reported for treating MI, antispasmodic, antidepressant activity, and is used as a skincare phytopharmaceutical, but its mechanism of action is yet to be established.

Aim & Objective: To investigate the mechanism of action of *C. sativus* constituents against MI.

Methods: *C. sativus* reported constituents were collected from literature. The phytocompound and MI targets were predicted by SuperPred DB ($p>0.7$) and GeneCards DB ($p>0.5$). Gene sets were executed for common genes using Venny 2.1 DB and pathway enrichment by STRING and KEGG DB. The network was constructed, molecular docking was performed for top hit complexes, followed by 100 ns MD simulations.

Results: A total of 132 genes were associated with MI were retrieved, while 9 phytocompounds targeted 963 protein molecules. Wherein, 128 genes were found to be commonly targeted in the role of MI. Gene set enrichment reveals that crocin B is highly modulated phytocompound and have notable significance to modulate ESR2, NOS2, and TLR4 protein targets within the network. Neuroactive ligand-receptor, PI3-Akt, HIF-1 signaling pathways were predicted as major involved pathways. Crocin B also had the highest number of intermolecular interaction and lowest BE with ESR2 (-8.0 kcal/mol), NOS2 (-9.7 kcal/mol), and TLR4 (-8.1 kcal/mol) during 100 ns MD simulation run.

Conclusion: *C. sativus* phytocompounds mainly Crocin B works via several proteins and multiple pathways, and can be add-on therapy in treating the MI.

Keywords: *Crocus sativus*, Male infertility, System biology, Molecular docking.

10. An *In-Silico* Investigation of Zerumbone on Different Targets of Huntington's Disease.

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Background:
Huntington's disease is a neurodegenerative disease that is caused by hereditary or age-related factors. Mutation of Huntingtin gene is primarily involved in development and progression of this disease. Neuroinflammation associated with - NF-KB pathway is responsible for cell death in neurodegenerative disorders like Huntington's disease .Currently there is limited therapy in this condition. Since neuroinflammation is involved in development and progression of the disease several laboratories across the world are working with various Phyto molecules to combat this disease. We at our laboratory are working with *Zingiber zerumbet* and this plant has showed anti-inflammatory, anti-hypersensitivity, and chemo preventive properties. One of the active constituents of this plant is Zerumbone. Hence, we tried to explore the interaction of zerumbone with various Huntington target protein through *in-silico* approach.

Aim of the study:
To create a network of disease and target genes and proteins that can be targeted for anti-inflammatory effect and to perform docking studies for desired target.

Materials and Methods:
To create a network, Gene card database was used to obtain disease targets in Huntington's disease. Around 600 targets were obtained using the following databases: Swiss Target Prediction, Pharm Mapper and SUPERPRED. After merging all the common compound targets with disease targets, 44 overlapping targets were obtained. The overlapping targets were then uploaded in cytoscape and a network was built using STRING protein network. Ligand docking was done using GLIDE and scoring was done using functions such as standard precision , high-throughput virtual screening and extreme precision are utilised.

Results:
The common targets obtained through network were CDK5,DRD2,BACE1,AKT1,HSP90AA1. Docking studies were later performed using zerumbone as the ligand against the four targets. The scores obtained were: -9.188,-4.690,-4.319,-3.732 respectively. More negative scores indicated greater binding. The results thus show that zerumbone has prominent action on the target CDK5.

Conclusion:
The key target CDK5 (Cyclin-dependent kinase 5), which is known to contribute to the onset of Huntington's disease showed a docking score of -9.188, indicating highest binding among all targets.
The development of several neurological diseases, including Huntington's disease, has been linked to the improper activation of CDK5. Huntington's disease is caused by mutant huntingtin protein, which is said to be phosphorylated by CDK5. CDK5 has also been linked to the production of toxic aggregates that cause neuronal malfunction and cell death. The above results have shown that Zerumbone has a potential to be a potent CDK5 inhibitor and hence can support further research into the potential therapeutic value of Zerumbone and suggest that it is a promising lead molecule for the creation of novel medicines.

Keywords: Huntington's, Zerumbone, Network, Docking.

11. Momordica charantia, Nigella sativa, and Anethum graveolens as potential combination therapy for the management of Metabolic Syndrome: An in silico and in vitro study

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Abstract

Background *Momordica charantia* (MC), *Nigella sativa* (NS), and *Anethum graveolens* (AG) are well-known medicinal plants possess anti-diabetic and anti-obesity properties. However, the molecular mechanisms for reporting their inhibitory effects on pancreatic lipase, alpha-glucosidase, and HMG-CoA reductase remain unexplored. **Aims & objectives** This study aimed to elucidate the efficacy of NS, MC, and AG extracts blends in targeting aforementioned targeting via utilizing an integrative approach combining *in vitro* assessments and molecular modeling techniques. **Methods** A factorial design matrix generated eight distinct concentration combinations of NS, MC, and AG, were screened for enzyme inhibition by *in vitro*. Molecular docking, molecular dynamics simulations, MMPBSA calculations, and principal component analysis were executed to infer the interaction of compounds from NS, MC, and AG against prioritized target enzymes. **Results** A formulation comprising NS:MC:AG at a 215:50:35 µg/mL ratio showed significant inhibition of pancreatic lipase (IC_{50}: 74.26±4.27 µg/mL). Moreover, a concentration combination of 215:80:35 µg/mL effectively inhibited both a-glucosidase (IC_{50}: 66.09±3.98 µg/mL) and HMGCR (IC_{50}: 129.03 µg/mL). Further, compounds from MC exhibited strong binding affinity towards all three enzymes, compared to their reference/standard compounds. Diosgenin, Momordicoside I, and diosgenin showed binding energies of -11.0, -8.8, and -7.9 kcal/mol with pancreatic lipase, a-glucosidase, and HMGCR, respectively. Further, 100 ns molecular dynamics simulations revealed the formation and stable non-bonded interactions between the compounds and the active site residues.

Conclusion Through the application of *in vitro* and molecular modeling methodologies, the study reports potent inhibitory activity of the NS:MC:AG mixture (at a ratio of 215:80:35 µg/mL) and specifically MC compounds to possess significant contribution in targeting pancreatic lipase, a-glucosidase, and HMGCR. This study concludes, NS, MC, and AG as potent anti-diabetic and anti-obesity plants and could be the valuable source for therapeutic development for metabolic syndrome.

Keywords: *Momordica charantia*, *Anethum graveolens*, *Nigella sativa*, Pancreatic lipase, Molecular docking, Molecular dynamics simulation

12. "A comparative study of GGDEF/GGEEF motif and GTP binding site of diguanylate cyclases in *Pseudomonas aeruginosa*"

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Abstract

Background: Diguanylate cyclase, an important enzyme found in all Gram-negative bacteria, functions as C-di-GMP (Cyclic-di-GMP) synthesized via condensing two molecules of GTP. This enzyme can be characterized by identifying conserved 'GGDEF' (Gly-Gly-Asp-Glu-Phe) or 'GGEEF' (Gly-Gly-Glu-Glu-Phe) motif at the active site.These amino acids share a unique secondary structure that helps in the synthesis of bacterial secondary signaling molecule C-di-GMP. The presence of these motifs in the active domain indicates the potential diguanylate cyclase activity of the protein It is evident that P. aeruginosa genome encodes for several GGDEF domain-containing proteins

Aim: A comparative study of GGDEF/GGEEF motif and GTP binding site of diguanylate cyclases in Pseudomonas aeruginosa.

Methods: Structural analysis of the selected proteins from Pseudomonas aeruginosa(Probable diguanylate cyclase) was done. Primary, secondary and tertiary structural analysis was done using CLUstal Omega, PsiPreD, 2dss, Multiprot, and EfSurf.

Results: 21 proteins were subjected to multiple sequence alignment, and we observed two conserved regions i.e. GTP binding region and GGDEF/GGEEF motifs in the domain (Figure 2). This conserved amino acid actively takes part in synthesis of secondary signaling molecule i.e C-di-GMP. The key role of this motif is to condense to two GTP molecules in antiparallel fashion to yield C-di-GMP. Hence, the exploration of secondary and tertiary scaffolds of this motif across diverse proteins derived from Pseudomonas aeruginosa was considered to be of significant in this study. Secondary structure analysis of these proteins was carried out using Muscle module in MEGA server it was found that though there is variation in amino acid, but secondary structure was preserved as such.

Conclusion: The structure of diguanylate cyclase in bacteria is remarkably diverse in nature and functions as controller of bacterial pathogenesis and bacterial biofilm formation by regulating intracellular C-di-GMP production. Mechanistic information on diguanylate cyclase is very scattered. To understand the structure of diguanylate cyclase, one must have a knowledge of geometric position of guanine base as well as C-di-GMP in effector domains of the protein. The present study aimed at identifying such guanine base binding sites based on existing data and compare GGDEF/GGEEF motifs of these protein to put more insights on structural diversity of this dynamic protein.

Keywords: Diguanylate cyclase, GG(D/E)EF domain, Pseudomonas aeruginosa, Biofilm, protein comparison.

13. In-Silico Design, Synthesis and Biological Evaluation of 4-Aryl-4h-Chromene Derivatives as Cdk-2 Inhibitors: A Molecular Approach to Finding A Lead For Breast Cancer

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ABSTRACT

Introduction: Breast cancer is a major health concern, with a mortality rate worldwide. Targeted therapy has emerged as a promising option for cancer treatment, particularly through the inhibition of cyclin-dependent kinase-2 holding a promise for combating this disease. **Methodology and result:** The potential of 4-aryl-4H-chromene derivatives as inhibitors of cyclin-dependent kinase-2 was evaluated in this study using the *in-silico* method. Amongst the 38 designed compounds, 13 compounds were identified as potential cyclin-dependent kinase-2 inhibitors based on their superiority within *in-silico* studies with docking scores ranging from -9.180 to -8.006 Kcal/mol and with favourable ADMET properties. These 13 compounds were later synthesized and characterized using spectral methods. Further, these compounds were assessed for their antioxidant and anticancer properties by *in vitro* assays. Compounds 2M and 2C displayed notable antioxidant potential with IC_{50} values of 24.44 µM and 39.03 µM, respectively, in DPPH and ABTS assays. The SRB assay on MCF-7 cells indicated that compound 1L demonstrated the strongest growth inhibition activity with an IC_{50} of 0.2 µM. Five other compounds (2O, 2K, 1C, 2M, and 2J) also exhibited promising activity with IC_{50} values ranging from 11.74 µM to 27.2 µM. **Conclusion**: In conclusion, 4-aryl-4H-chromene derivatives can be considered potential lead candidates for breast cancer treatment.

Keywords: Breast cancer, Targeted therapy, 4-aryl-4H-chromene, *In-silico*, ADMET, One-pot synthesis, Antioxidant.

14. Integrative Analysis of GLI1 in Colorectal Adeno Carcinoma Patients

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Keywords: Shh signaling, GLI1, Pathway alteration, differential expression

BACKGROUND

Despite of all the improvements in Colorectal Cancer (CRC) treatment, the metastasis of CRC is the major culprit of poor survival outcomes of the patients. Sonic hedgehog signaling has a crucial role in the metastasis of CRC, GLI1 being the major transcription factor of the signaling. Past attempts in proteomics to combat cancer have been restricted to a targeted examination of 200 protein characteristics made available by the Reverse Phase Protein Array platform, such as those made by The Cancer Genome Atlas (TCGA). Using extensive proteomics, the Clinical Proteomic Tumour Analysis Consortium (CPTAC) of the National Cancer Institute is a national initiative to hasten the understanding of the molecular basis of cancer (Zhang et al.). In contrast, mass spectrometry-based proteomics enables the profiling of thousands of proteins, offering CPTAC proteomics data a singular opportunity that is utilized in the current study.

OBJECTIVE

The study aimed to analyze the involvement of GLI1 in Colorectal Adeno Carcinoma patients (COAD) using web tools. The fundamental methodology of our work is to analyze the involvement of the gene GLI1 in COAD patients. The differential expression is based on age, race, histological stages, and individual cancer stages. The study also aimed to investigate the pathway alteration ability of GLI1. The correlation and the survival analysis also shed light on the involvement of GLI1 in COAD patients.

METHODOLOGY

The major web-based tools used for the study are UALCAN, STRING, and KM Plotter. The analysis of GLI1 in COAD samples reveals that GLI1-expressed tumor samples also exhibit an alteration in pathways.

RESULTS

The pathways that have shown alterations are the WNT pathway,mTOR, RTK, and p53/Rb-related pathway. SWI-SNF complex is reported to be altered. MYC/MYCN also shows alteration. Along with it chromatin modifier alteration is also reported in COAD samples where the GLI1 is expressed. The non-significant interaction is shown by the Hippo pathway and NRF2 pathway. The correlation analysis of UALCAN is utilized to study the most correlated genes with GLI1.

The analysis showed that FAM19A5, FBLN1, GLIS2, LRRC32, and GLI2 are the most correlated genes with Pearson correlation coefficients 0.79,0.81,0.77,0.79,0.73 respectively. The genes that are shown to be co-occurred and have a close interaction with GLI 1 are analyzed for the survival of the GIT cancer patients. The analysis showed that the genes under analysis were GLI1, PDGFRB, EVC, and RABIL1. The survival time of the high-expression cohort has been reduced significantly. The differential expression analysis showed that stage III COAD patients and mucinous carcinoma patients express GLI1 significantly.

CONCLUSION

The analysis and further research on the correlated genes with GLI1 may reveal new cross talks in CRC. The intriguing finding that we made is that Gli1-expressing tissues have been found in colon cancer, ovarian cancer, and pancreatic cancer in all the altered pathways stated above. The development of drugs that can affect Gli1 and other key components of the altered pathways is essential for the development of an effective treatment plan.

15. In Silico Insights into Benincasa hispida (Thunb) Compounds: A Step Towards Obesity and IBD management.

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Abstract:

This study presents a systematic examination of 95 compounds from Benincasa hispida (Thunb.), with 21 demonstrating positive drug-likeness scores and adherence to Lipinski's Rule of Five, compound-gene set pathway enrichment analysis, network pharmacology, docking studies, and molecular dynamics simulation. The safety assessment of compounds revealed non-toxic properties by using protox, crucial for therapeutic consideration. Compounds target proteins associated with obesity and IBD management were identified based on successful and approved targets available in the Gene Card and Omim Database by plotting venn diagram. Pathway enrichment analysis identified 443 targets within 201 distinct pathways, with 16 directly linked to the pathogenesis of obesity and IBD. Therapeutic targets, such as PIK3CB, PIK3CA, MAPK1, GSK3B, and MTOR, were identified, by STRING and KEGG pathway databases were used to analyse the molecular pathways modulated by the protein targets. Interactions between compounds, proteins, and pathways were visualized using Cytoscape 3.6.1. further, the Molecular docking of compounds with protein targets was performed using AutoDock 4.2, and Molecular Dynamics Simulation of the complex with the protein at 200 ns was noted to be stable throughout the simulation where, parameters such as RMSD, RMSF, SASA, and Radius of Gyration further elucidated interactions with these targets, offering valuable insights into potential effectiveness. The findings suggest that compounds from Benincasa hispida, targeting key pathways, hold significant promise for obesity and IBD management. However, further in vivo and clinical validation is essential to confirm their efficacy and safety in real-world applications.

Keywords: Benincasa hispida, Obesity and IBD management, Network pharmacology, Molecular docking, Molecular dynamics

16. In Silico Approach to Elucidate Activity of Arthrospira Platensis

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ABSTRACT

Background: Parkinson's disease is a brain disorder that causes unintended or uncontrollable movements, such as shaking, stiffness, and difficulty with balance and coordination. Spirulina (Arthrospira platensis) is a filamentous and multicellular blue-green alga capable of reducing inflammation and also manifesting antioxidant effects. However, its effect in Parkinson's is not known till date. Hence, the present study aims to elucidate the probable molecular mechanism of anti-Parkinson effect of Arthrospira Platensis using network pharmacology.

Objectives:- 1) Prediction of anti-Parkinson activity of Arthrospira Platensis through data mining. 2) Network construction that uses computational methods using Cytoscape 3.6.1.

Methods: The 2D structural information of the bioactive phytoconstituents was retrieved from various database sources. Molecular characteristics were found with the help of BindinDB and PubChem. The compounds were later predicted for their _Hits'on the probable targets involved in Parkinson's disease. Drug likeliness score for the phytoconstituents was found with the help of Molsoft. The targets associated with Parkinson's were referenced from TTD. Gene ids associated with Homo sapiens were referenced from uniprot. The modulated protein pathways were identified by using StringDB and Kyoto encyclopaedia of Genes and Genomes [KEGG] pathway analysis. The interaction between compounds, proteins, and pathways were predicted based on edge count using Cytoscape 3.6.1.

Results: 13 phytoconstituents have been found to alter the protein pathogenic protein molecules involved in Parkinsons disease which are quercetrin, quercetin, apigenin, naringenin, hespiritin, rosmarinic acid, catechein, kaempferol, chlorgenic acid, caffeine, 3'-hydroxyechinenone, riboflavin, salicylic acid. Among them quercetin, apigenin and kaempferol scored high drug likeliness and had the maximum interaction with proteins involved in Parkinson. Metabolic pathway, neuroactive ligand-receptor interaction, cAMP signaling pathway, calcium signaling pathway, dopaminergic synapse, morphine addiction and alcoholism pathway were predicted as majorly modulated pathways.

Conclusion: Current study identified kaempferol, apigenin and quercetin as important anti Parkinson compound to modulate DRD2 (G- protein coupled receptor), DRD1, COMT, MAOA and MAOB ligand-receptor interactions.

Poster Presentations

Stream 3: Drug discovery from Natural and Biological Sources

1. Pharmacognostical, Phytochemical and *in vitro* Pharmacological Studies on the leaves of *Garcinia mangostana L. Guttiferae*

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Abstract:

Background: Plants are one of the foremost sources of natural medicine and a large number of modern drugs have been obtained from them.*Garcinia mangostana* L.is a tropical evergreen tree considered as "The queen of fruit" of the family Guttiferae. The plant are seen in the rain forests of India used by the folk peoples for curing diseases, so it is compulsory to standardize as highly valuable drug and can be integrated in Indian System of Medicine. The literature search disclose that most studies are conducted on fruit, stem, bark etc.not much studies are done on leaves.

Aim and objectives: The purpose of this study was to explore the Pharmacognostical features, estimate the physicochemical parameters and to conduct antioxidant assays, *in vitro* cytotoxic assays, anti diabetic alpha amylase activity, antimicrobial studies for the plant *Garcinia mangostana L. Guttiferae* leaves.

Methodology: Pharmacognostical evaluation of the dried and fresh leaves to find out the anatomical features of the leaves it includes the macroscopical and microscopical studies. Phytochemical studies mainly Successive solvent extraction of powdered leaves by maceration and soxhlation using the different solvents of increasing polarity, preliminary phytochemical screening of various extracts, Quantitative estimation of phytoconstituents, Thin layer chromatography, Adsorption column chromatography of most active extract , Spectral analysis of isolated compounds. In -vitro pharmacological studies such as Anti-oxidant DPPH activity, Anti-cancer MTT assay, Anti-diabetic alpha-amylase inhibition activity and Anti- microbial activity.

RESULTS: Microscopical and macroscopical features will help in the authentication of plant material. The standardization of the drug was conducted by determination of various Physicochemical parameters like Ash values, extractive values, loss on drying, detection of inorganic constituents and fluorescence behavior and these parameters helps to develop standards and to determine purity and quality of the drug. The coarse powder was used for Successive Maceration and Soxhlation using solvents such as Petroleum ether, Chloroform, Ethyl acetate, Methanol and Chloroform water. Soxhlet extraction using Ethyl acetate as solvent given the maximum yield. Ethyl acetate extract contains alkaloids, flavonoids, phenolic compounds and carbohydrates. Ethyl acetate extract shows significant anti-oxidant activity. Antidiabetic activity was determined by alpha-amylase inhibitory assay using Acarbose as standard. The ethyl acetate extract showed significant anti-diabetic activity as compared to standard. Antimicrobial study was done using *Staphylococcus aureus* and *Candida albicans.* The study showed significant anti-bacterial activity against *Staphylococcus aureus* and mild activity against *Candida albicans.* Anticancer activity studies by MTT assay revealed that ethyl acetate extract significantly decreased the percentage cell viability on MDA-MB-231 cell lines.

CONCLUSION: In our study phytoconstituents present in the leaves of the plant *Garcinia mangostana L.* extracted with ethyl acetate shows Anti-oxidant, Anti-cancer, Anti-diabetic and Anti-microbial activity.

Keywords: Phytochemical screening, *In - vitro* assays such as antioxidant, anti-cancer, anti-diabetic, anti-microbial activities.

2. Exploring the mechanism of Glycyrrhisoflavone and Cladrin in the Diabetic Wound Healing: A Network Pharmacology and Molecular Docking Investigation

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Abstract:
Background: There is a need for novel therapies since diabetic wound healing is challenging due to impaired processes in tissue repair. The anti-inflammatory and antioxidant effects of isoflavanoids suggest that they may accelerate the healing of diabetic wounds. Complex interactions between isoflavonoids and important biological pathways can be discovered through network pharmacology, which offers an in-depth understanding. This proposed concept focuses on molecular networks to advance knowledge and direct specialised therapy approaches for isoflavonoid-mediated diabetic wound healing.
AIM: The aim of the study is to explore the mechanisms of Isoflavanoids: Glycyrrhisoflavone and Cladrin in diabetic wound healing through network pharmacology and molecular docking.
Methods: Drug-likeness properties of the ligands were assessed using SwissADME and ADMETLab 2.0. The targets of Glycyrrhisoflavone and Cladrin were identified using Swiss Target Prediction, SuperPred and BindingDb and the targets of Diabetic wound healing were identified using DisGeNet and GeneCards database. Venn diagram analysis was done to find common targets between Diabetic wounds and the ligands using Venny 2.1 online tool. PPI network was obtained using STRING Database and Cytoscape plugin and 10 hub genes were identified using Cytohubba of cytoscape based on Degree and Betweenness centrality method. Important pathways, biological process, cellular components, and molecular functions in which the hub genes were involved were studied. Molecular docking and MM/GBSA were performed with the help of Schrodinger software for top 4 hub genes.
Results: The ligands showed good bioavailability (>0.50), high GI absorption and no violations of Lipinski rule. Around 100 targets of Glycyrrhisoflavone and Cladrin and 522 targets of the Diabetic wound were identified using the database like Swiss Target Prediction, SuperPred and BindingDb and DisGeNet and GeneCards database respectively. 13 common targets were identified among the ligands and the disease using Venny tool. A circular PPI network was constructed as mentioned under methodology where NFKB1 had the highest degree and NFE2L2 with the lowest degree. Top 20 pathways where the hub genes were involved were identified and the 17 biological processes, 5 cellular components and 18 molecular functions where those hub genes were involved were identified using ShinyGo 0.77 database. Molecular docking and MM/GBSA results were highest for NFKB1 and PPARA proteins than the other two proteins for both the ligands and these results were obtained using the Schrodinger Software.
Conclusion: Promising results in Network Pharmacology and Docking experiments indicate the potential of combining glycyrrhisoflavone and cladrin as a therapy for diabetic wounds. To support this conclusion and progress, these ligands could be an effective treatment for diabetic wound healing, wherein further experimental validation is required.
Keywords: Network Pharmacology, Isoflavanoids, Molecular Docking, MM/GBSA.

3. UNDERCOVERING THE POTENTIAL ACTIVE CONSTITUENTS OF *PERSEA AMERICANA* FOR RHEUMATOID ARTHRITIS TREATMENT USING NETWORK PHARMACOLOGY

ABSTRACT

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Background: Rheumathoid arthritis (RA) is a chronic autoimmune disease characterized by inflammation and joint destruction, leading to significant disability and decreased quality of life. Natural products are an important source of novel therapeutics for RA.
Aim: In this study, we aimed to identify potential bioactive compounds from *Persea americana* (Avocado) for the treatment of RA using in silico approaches.
Methods: We collected phytoconstituents of avocado from IMPPAT and used Data Warrior software to filter out 64 plant constituents based on ADMET criteria. Target genes were identified using Binding db web server, resulting in the identification of 209 genes from *Persea americana*. We then performed protein-protein interaction network analysis and identified the top genes for further analysis. By using the Cytoscape software, the network of PPI was analyzed, and the top ten most-connected targets were identified. The key nodes in the PPI network were identified and analyzed for protein-drug interactions, and ten components were found to have high binding affinity. Molecular docking was carried out for these top ten plant constituents with top five proteins in PyRx software, and it was found that PTGS2 (5F19) had the highest binding affinity with Luteolin. PTGS2 is involved in inflammation of the joints, and blocking it can potentially reverse the harmful effects of RA. Our results suggest that avocado constituents particularly.
Conclusion: Luteolin, could be developed into novel therapeutics for the management and treatment of RA. Further experimental studies are required to validate these findings and determine the efficacy of these compounds in vivo.
Key words: Persea americana, Rheumatoid arthritis, protein-protein interaction, protein-drug Interactions, Molecular docking.

4. Nurturing Nature through Nature: Isolation and Characterisation of Microbes for Bioremediation of Kertain Rich Wastes in the Quest for Sustainable Development

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Background:
In accordance with the UNGA goals with respect to sustainable development that needs to be achieved by 2030, a comprehensive waste management system needs to be set up. As per a statistical report, about 2.01 billion tonnes of municipal solid waste is generated annually at a global scale out of which about one-third of it is not managed in an environmentally safe manner. Keratin is a key structural protein that can be found in a variety of forms in nature, including hair, feathers, nails, horn, hoofs, scales, and wool which could be among the many substances that could add up to the solid waste. Keratin-rich waste possesses a high content of amino acids and, if not correctly managed, can harm the environment, water supplies, and soil. This form of waste, on the other hand, can be used for less-cost amino acid sources, can be turned into animal feeds, or used as a fertilizer. The present research work aims at isolating and characterizing microbes that could produce keratinase which could be used for the management of keratinous substances. This would also cater to Sustainable development goal number 12 which includes responsible consumption as well as production including the major focus on environmentally sound ways to manage waste through either its prevention, reduction, recycling, or reuse of such solid wastes including keratin.
Keywords: Sustainable development, Bioconversion, Keratin, Characterization
Aim:
To isolate and identify naturally occurring keratinase producing microbes from soil sample and study its biochemical properties.
Methods:
1) Isolation of keratinolytic bacteria from soil sample.
2) Screening of bacteria through microscopic and biochemical characterization.
3) Identification of bacteria through sequencing by VITEK and BIOLOG
Results:
Keratinolytic activity of the bacteria isolated from the soil sample was confirmed by their growth on keratin agar. Four distinct colonies were isolated, two small colonies named S1, S2 and two bigger colonies named B1, B2. Biochemical characterization included tests on starch agar plates and IMViC tests. Furthermore, all tests and studies were conducted on S2 strain due to its characteristic growth pattern and was sent to NCMR, NCCS Pune for sequencing which revealed that the isolate S2 is 99.85% related to the *Pseudomonas aeruginosa* JCM 5962(T) strain.
Conclusion:
Solid waste management, a cause of global concern should be on the top priority list of every individual. By the year 2050, 3.40 billion tonnes of waste is expected to get accumulated on an annual basis. Keratin found in many solid wastes add a huge chunk to the 70% of the staggering increase in the next 30 years. It is thus imperative from our side to manage this solid waste into something useful by various recycling methods or the use of enzymes to degrade this waste on a faster basis as well as to convert them into more useful byproducts. Careful and responsible

management of goal 12 would guarantee a sustainable environment for the coming generations leading to a healthier life.

5. Analysis of The Effect of Antimicrobials in Personal Hygiene Products on Selected Microbes

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Background
The assessment of antiseptic and disinfectant efficacy is crucial prior to their routine use. Manufacturers employ diverse evaluation methods to ensure the safety and effectiveness of these products, and researchers also play a significant role in verifying product efficiency. The evaluation of antimicrobial agents' effectiveness involves microbiological techniques, primarily conducted on microorganisms. Laboratory microorganisms such as *Bacillus subtilis, Escherichia coli, Staphylococcus aureus, Pseudomonas aeruginosa*, among others, are commonly employed for this purpose. Additionally, since various other organisms are present in the environment, we utilize environmental samples such as soil to assess the effectiveness of these products against a broader spectrum of organisms.
Aim: To compare the effectiveness of different antiseptic and disinfectant on isolate from soil sample
Method: Zone of inhibition, Crowded plate technique, Gram's Staining, Hanging drop technique, IMViC test.
Results: Arvelon and Apollo, Dettol antiseptic, were more efficient than Yardley, Listerine.
Conclusion: Microbiological evaluation of five antimicrobial agents (Yardley, Arvelon, Apollo, Listerine and Dettol) were carried out and it was observed that Dettol, Arvelon and Apollo antiseptic were more efficient than Yardley, Listerine. Isolated a microbe from soil sample with tolerance to high salt concentration along with inulinase activity.
Keywords: Antiseptics, Disinfectant, Soil Sample, Inulinase.

6. Network pharmacology and molecular docking analysis reveals MAPK as key target of sunflower seed oil against Alzheimer's disease

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Abstract

Background

Alzheimer's disease (AD) emerged as a global health challenge with the increasing ageing population. Acetylcholinesterase inhibitors remain the main stay for treating the AD symptoms. However, they do not attempt to prevent the disease. In this context, natural compounds are extensively studied as neuroprotectives in preventing the disease progression with fewer side effects.

Aim

The aim of this study is to evaluate the neuroprotective effect of Helianthus annuus (HA) seed oil (HA) in mice model of scopolamine-induced amnesia and explore the potential underlying mechanisms through network pharmacology and molecular docking studies.

Method

24 male mice (n=6) were either administered orally distilled water (control and scopolamine groups) or HA in the treatment groups (HA 100 and HA 200 mg/kg) for 7 consecutive days. Scopolamine (1 mg/Kg, i.p.) was administered on the 8^{th} day in all the animal groups except the control for which saline was administered. 1 hour following this, mice were subjected to locomotor testing and novel object recognition task. Additionally, pathway and network analysis were performed to identify the key targets involved in the mechanism of HA against AD. Binding of potential bioactives of HA to the key targets was verified by molecular docking analysis.

Results

Treatment with HA at both doses significantly improved retention memory compared to the scopolamine group with no effect on locomotion. These findings suggest that HA may have neuroprotective effects against cognitive impairment in AD. Network analysis revealed that chlorogenic acid could be the key bioactive acting through multiple targets and pathways to ameliorate AD symptoms. Importantly, chlorogenic acid showed good binding affinity with mitogen activated protein kinases (MAPK1, MAPK 8, MAPK13). However, further studies are required to validate these findings and explore the potential use of Helianthus annuus as a dietary supplement for preventing AD.

Conclusion

Our current research shows that HA significantly reduces scopolamine-induced amnesia in mice, suggesting possible therapeutic benefits for AD patients. We further suggested that HA may enhance neuroprotective effects by acting through its principle component, chlorogenic acid, through MAPK pathway.

7. CHARACTERIZATION AND EVALUATION OF PROBIOTICS ISOLATED FROM BUFFALO INTESTINE

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Background: Probiotics are live microorganisms that , when administered in adequate amounts, confer a health benefit to the host. Probiotics are thought to exert their beneficial effects through a variety of mechanisms, including modulation of the gut microbiota , reinforcement of the gut barrier, and stimulation of the immune system.
Aim& Objective: The aim of this project is to characterize and evaluate the probiotic properties of bacterial strains isolated from the intestine of buffaloes. And the objective to collect bacterial strains from the intestines of buffaloes.
Methods:

- Culturing the organism from duodenum, jejunum, ileum.
- Isolation and purification of organism by spread plate method.
- Characterization of probiotics from different attributes.
- Gram's staining , Indole production test Antibiotic Susceptibility test and Citrate Utilization test.

Result: Gram's staining The present studies focused on the four isolated bacterial strains were identified based on bergey's Manual of Determinative bacteriology. The bacterial strains were observed by light microscope. The all twenty five bacteria samples are gram- positive.
Conclusion: In conclusion, the study focused on various aspects related to the isolated bacterial strains from small intestine of the buffalo.
Keywords:
Preparation of stock culture (broth) , Preperation of stock culture (Agar) , Gram's staining, Indole production test , Citrate utilization test and Antibiotic susceptibility test.

8. Identification and Amplification of Chitinase gene from Novel *Paenibacillus elgii* PB1

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ABSTRACT:

Background: Chitinases are enzymes that break down the biopolymer chitin. As chitin is the second most abundant polymer found in the world after cellulose, the enzyme's property to digest it has large-scale applications ranging from waste management, the pharmaceutical and agricultural industry (1-4). This enzyme is produced by various organisms including plants, animals, fungi, and bacteria which have been categorized into family 18 and 19 of glycosyl hydrolases (1,3). Although studies have been carried out on these enzymes obtained from various sources, the major hiccup in the analysis and assessment of them lies in the purification and production of enzymes. Gene cloning is an effective technique to tackle these issues (5-7). *Paenibacillus elgii* PB1 is a novel strain that was isolated and showed chitinase production as well as significant antifungal activity previously in our laboratory (8). Cloning of the chitinase gene from this organism will provide us with a purified isolated enzyme which can be later produced in large quantities as and when required.

Aims: Identification and amplification of the chitinase gene

Methods: Screening and selection of the gene for the study were done using BLASTp software and UniProt database. Primers were designed accordingly for the Polymerase Chain Reaction (PCR) and custom synthesized. The genomic DNA of *Paenibacillus elgii* PB1 was extracted using phenol chloroform method (9) and PCR was carried out using the primers (10). The amplification was observed by agarose gel electrophoresis as compared to a housekeeping 16s rRNA coding gene of nearly the same size.

Results: The concentration of isolated DNA was 75.7 ug/ml while the A260/A280 ratio was 2.0. The chitinase gene got amplified and was observed at the size of 1.5k base pair band as estimated hence confirming the presence of the screened gene in the isolate.

Conclusion: The identification of the chitinase gene present in the isolate enables us to carry forward the study in order to clone the gene to obtain purified enzyme in larger quantity.

Keywords: Chitinase, PCR, DNA isolation, Chitin

9. Network Pharmacological of Ayurvedic Formulation -Carctol

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Abstract

Background: Carctol is an Ayurvedic formulation widely used in UK as a complementary and alternative therapy for cancer. Caractol is composed of eight Indian medicinal plants: *Hemidesmus indicus* (roots), *Tribulus Terrestris* (seeds), *Piper cubeba* Linn. (seeds), *Ammani baccifera (vesicatoria)* (plant), *Lepidium sativum* Linn. (seeds), *Blepharis edulis* (seeds), *Smilax china* Linn. (roots), *Rheum emodi wall* (roots). However, the scientific evidence to support the effectiveness is missing. The network pharmacology will help to assess the biological target mechanism, and hence, the ideation of this work was conceived.

Aims: To develop the network pharmacology for Carctol by constructing Protein-Protein Interaction (PPI) and Pathway-Target Interaction (PTI) networks.

Methods: The phytochemicals were identified from IMPPAT database. Phytochemicals having Drug likeliness >0.1 and oral bioavailability >30% were selected using the TCMSP database. DisGeNet database was used to find disease targets. Potential targets for compounds were found using the PharmMapper. The common targets between the disease and phytochemicals were identified to generate a list of overlapping targets. A PPI network for the overlapping targets was created using the Cytoscape 3.10.0 software using the STRING Protein query. Similarly, GO/KEGG-pathway analysis was performed using the DAVID database, and pathways along with their targets were selected for the PTI network. Common targets between PPI and PTI were selected for molecular docking and estimation of binding energy.

Results: Based on the database, there were 19 potent phytochemicals, 774 disease targets and 74 overlapping targets between disease and phytochemicals. There were 76 significant pathways, and using targets corresponding to each pathway, PTI network was built. There were 21 common genes from the PPI and PTI, which were docked with phytochemicals. D-catechin, Aloe-emodin, Ellagic acid, Piceatannol, and Cubebin showed significant Docking scores and MMGBSA scores (kcal/mol) with 16, 14, 13, 12, and 10 targets, respectively. Ellagic acid showed the most significant docking score of -10.585 kcal/mol and binding energy of -72.91 kcal/mol with AKT1. Similarly, ellagic acid also showed effective binding energies with RAF1, MET, JAK2, BCL2L1 and SRC. D-catechin and Aloe-emodin significantly bound to 14 targets as follows: JAK2, MET, SRC, IGF1R, MAPK8, PTK2, EGFR, RAF1, IGF1, MAPK1, GSK3B, PIK3R1, MAPK14, AKT1. Based on pathway-target analysis, the PI3K-Akt signalling pathway was confirmed, Ras signalling pathway, MAPK signalling pathway, Rap1 signalling pathway and focal adhesion pathways were the others.

Conclusion: The major cancer drug targets involved in Carctol are AKT1, SRC, IGF1R, MAPK1, EGFR, and PIK3R1. Further *in vitro* and *in vivo* research is required to validate its efficacy.

Keywords (3-4 words): Carctol, Network pharmacology, Lung cancer, Docking.

10. Network Pharmacology of Hibiscus rosa-sinensis for Lung Fibrosis

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Abstract

Background: *Hibiscus rosa-sinensis* is an Ayurvedic herb. Traditionally its floral parts are used in treating cardio-pulmonary diseases, hair loss, and skin diseases. *Hibiscus rosa-sinensis* is rich in phytochemicals that have antioxidant and anti-inflammatory activities. These properties are also essential in treating lung fibrosis. Hence, in this work, we followed network pharmacology to reveal active phytoconstituents with specific biological target mechanisms in lung fibrosis.

Aims: To develop the network pharmacology for *Hibiscus rosa-sinensis* by constructing Protein-Protein Interaction (PPI) and Pathway-Target Interaction (PTI) networks against Lung fibrosis.

Methods: The phytochemicals of *Hibiscus rosa-sinensis* were identified from the IMPPAT database. Phytochemicals having high Gastrointestinal absorption, Drug likeliness >0.1 and oral bioavailability >30% were selected using the SwissADME database. The DisGeNet database found potential disease targets with a gda-score >0.1. Potential targets for phyto-molecules were found using the SuperPred. A list of overlapping targets between the disease and phytochemicals was generated. A PPI network for these overlapping targets was constructed using the Cytoscape 3.10.0 software and the STRING Protein query. Similarly, the DAVID database was used for GO/KEGG-pathway analysis, and pathways and their targets were chosen for the PTI network. Shared targets between PPI and PTI were selected for molecular docking and binding energy estimation.

Results: The databases revealed 22 potent phytochemicals, 1068 disease targets and 112 overlapping targets between disease and phytochemicals. The top 20 hub genes were selected through the PPI network. There were 30 pathways and 15 common genes for the phytochemicals. Cyanidin, quercetin, and their natural derivatives showed significant Docking scores and MMGBSA scores (kcal/mol) with targets like HSP90AA1, SRC, STAT1, TLR4, MAPK1, HIF1A, HSP90AB1, STAT3, PTPN11 and MAPK3. Cyanidin 3-sophoroside and Quercetin-3,7-diglucoside showed the most significant docking score of -14.714 kcal/mol and binding energy of -80.67 kcal/mol with HSP90AA1 and -12.801 kcal/mol and binding energy of -70.75 kcal/mol with SRC, respectively. Similarly, Quercetin-3-diglucoside and vitamins like ascorbic acid and riboflavin showed effective binding energies with SRC, HIF1A, STAT1, HSP90AA1, MAPK1, PTPN11, HSP90AB1 and TLR4. Based on the PTI analysis, Hibiscus rosa-sinensis extract will act through the NOD-like receptor signalling pathway as it had the maximum number of docked targets. Similarly, other pathways like MAPK signalling, HIF-1 signalling and PI3K-Akt signalling were also involved.

Conclusion: Network pharmacology study revealed that the proteins HSP90AA1, SRC, STAT1, TLR4, MAPK1 and HIF1A are primary drug targets of *Hibiscus rosa-sinensis* in lung fibrosis and act through NOD-like receptor signalling pathway. However, further *in vitro* and *in vivo* research is required to validate its efficacy.

Keywords (3-4 words): *Hibiscus rosa-sinensis*, Network pharmacology, Lung fibrosis, Docking.

11. Network Pharmacological Evaluation of *Zingiber zerumbet* Rhizome Extract for Allergic Asthma

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Abstract

Background: *Zingiber zerumbet,* also known as 'shampoo ginger, possesses various phytomedicinal properties, such as anticancer, antimicrobial, anti-inflammatory, antiulcer, and antioxidant properties. It has proven anti-allergic and immunomodulatory activity. It has shown promising results against various types of cancer. These properties are complementary to treat allergic asthma. Hence, in this work, we followed network pharmacology to reveal active phytoconstituents with specific biological target mechanisms in allergic asthma.

Aims: To develop the network pharmacology for *Zingiber zerumbet* by constructing Protein-Protein Interaction (PPI) and Pathway-Target Interaction (PTI) networks against allergic asthma.

Methods: The phytochemicals were identified from IMPPAT database. Only the phytochimcals from the rhizome part were only considered. A total of 141 constituents were found and all were taken for evaluation. DisGeNet database was used to find disease targets. Potential targets for compounds were found using the PharmMapper. The common targets between the disease and phytochemicals were identified to generate a list of overlapping targets. A PPI network for the overlapping targets was created using the Cytoscape 3.10.1 software using the STRING Protein query. Similarly, GO/KEGG-pathway analysis was performed using the DAVID database, and pathways along with their targets were selected for the PTI network. Common targets between PPI and PTI were selected for molecular docking and estimation of binding energy.

Results: Based on the database, there were 141 potent phytochemicals, 371 disease targets and 39 overlapping targets between disease and phytochemicals. There were 56 significant pathways, and using targets corresponding to each pathway, PTI network was built. There were 24 common genes from the PPI and PTI, which is being docked with phytochemicals. Major genes involved are GSTM1, NOS3, GSTP1, AKT1, MAPK14, MMP9, RHOA, CCL5, MAPK1, and PPARG. The major pathways involved are TNF signalling, phospholipase D signalling, AGE-RAGE signalling.

Conclusion: Network pharmacology of *Zingiber zerumbet* rhizome revealed specific anti-inflammatory pathways. Further, *in silico* screening such as molecular docking and MMGBSA required before testing it in tissues and animals for its proof of concept.

Keywords (3-4 words): *Zingiber zerumbet*, Network pharmacology, Allergic asthma, Docking.

12. Systems and Network Pharmacology of Pushkaramoolasava an Ayurvedic formulation for Tuberculosis

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Abstract

Background: Pushkaramoolasava is a classical, well-proportioned Ayurvedic formulation capable of exhibiting inherent outcomes in the management of respiratory disorder especially for tuberculosis, asthma and COPD.The formulation comprises about 25 Ayurvedic medicinal plants like Inula racemosa, Fagonia cretica, Coriandrum sativum, Piper nigrum, Rubia cardifolia, Zingiber officinalis etc. constituting a major fraction. However the scientific rationale and the complex interaction of molecules with its target is still unclear. But this Indigenous knowledge can be further refined to uncover potential lead molecules in the treatment of Tuberculosis. Here we have used network pharmacology which takes advantage of computational power to systematically catalogue the molecular interactions of a drugs in a living cell and might be possible to rationally design the next generation of promiscuous drugs.

Aim: To develop the network pharmacology for Pushkaramoolasava by constructing Protein-Protein Interaction (PPI) and Pathway-Target Interaction (PTI) networks against Tuberculosis.

Methods: Phytochemicals from major plant species constituting the formulation were identified using the IMPPAT database and further screening based on parameters like solubility, absorption, drug likeliness, MLogP value and bioavailability ≥ 0.55 using SwissADME database. Disease target identified using DisGeNet database, Superpred was used to find targets for phytomolecules. A list of overlapping targets was generated by identifying the common targets between the disease and phytochemicals. A PPI network for the overlapping targets was created using the Cytoscape 3.10.0 software using the STRING Protein query. Similarly, GO/KEGG-pathway analysis was performed using the DAVID database, and pathways along with their targets were selected for the PTI network. Common targets between PPI and PTI were selected for molecular docking and estimation of binding energy.

Results: A total of about 554 constituents were found from IMPPAT, from which 17 biologically active molecules were selected. These 17 potent phytochemicals, 359 disease targets and 27 overlapping targets between disease and phytochemicals. There were 79 significant pathways, and using targets corresponding to each pathway, PTI network was built. Common genes from PPI and PTI is to be docked with phytochemicals. Major genes involved are PDE3B, PIK3CD, PIK3CB, PIK3R1, MAP2K2, CHUK and NOS3.

Conclusion: Network pharmacology of Pushkaramoolasava revealed specific anti-inflammatory pathways. Further, *in silico* screening such as molecular docking and MMGBSA, is required before testing it in tissues and animals for its proof of concept.

Keywords (3-4 words): Pushkaramoolasava, Network pharmacology, Tuberculosis, Docking.

13. Evaluation of antiurolithiatic activity of different herbal formulations available in the market

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Background: Urolithiasis is a common and debilitating condition that affects millions of people worldwide. The current treatments for kidney stones are often invasive, costly, and associated with significant side effects. Therefore, there is a need for safe and effective therapies that can prevent and treat kidney stones without causing harm to the patients.

In this study, we evaluated the efficacy of herbal formulations in reducing or preventing the formation of calcium oxalate using an in-vitro method (turbidimetric method). Our findings suggest that the herbal formulations used in this study may have potential as an alternative or complementary therapy for urolithiasis.

Aim: To assess the effectiveness of various herbal formulations available in the market in preventing or treating urinary stones.

Method-Turbidimetric study: In this study, a UV-Vis spectrophotometer (Shimadzu UV-1900i) was used to determine the turbidity of the formation of calcium oxalate. The precipitation of calcium oxalate has been studied by the measurement of turbidity at 620nm for 880 seconds Readings were taken every 20 seconds. The study was conducted without and with inhibitors. The below-mentioned formula was used to calculate the rate of inhibition.

$I (\%) = (1 – Spe / Sae) \times 100$ Where, Spe and Sae are the turbidimetric slopes respectively in the presence and absence of herbal formulations.

Result: This method involves measuring the degree of turbidity or cloudiness caused by the growth of calcium oxalate in a solution, and then measuring how much the herbal formulations have inhibited or reduced the turbidity. Among the three different brands of herbal formulations tested for their efficacy, Cystone showed remarkable activity followed by Renali and Neeri.

Keywords: Antiurolithiatic, Turbidimetry, Calcium oxalate, Urolithiasis

Poster Presentations

Stream 4: Pharmacology and Toxicology

1. Invitro antioxidant activity of *Syzygim caryophyllatum* L using DPPH method

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Abstract

Background: *Syzygium caryophyllatum* L is a small tree or large shrub grow widely mainly in the tropical area. It is native to India and china. *S caryophyllatum* L belonging to the family Myrtaceae is taken for the study.

Aim: Aim of the present work is to isolate the phytoconstituents and to screen the antioxidant activity of *S caryophyllatum.* From the literature survey it was found that no substantial work has been carried out to isolate the phytoconstituents and to screen the antioxidant activity of *S caryophyllatum*. Hence an effort has been made to carry out the phytochemical investigation and to screen the antioxidant activity using DPPH assay.

Methods: Isolation of phytoconstituents were carried out using column chromatographic technique and antioxidant activity was carried out using DPPH method.

Results: Chemical investigation of the leaves of *S. caryophyllatum* led to the isolation of Quercetin, 3,7- Dihydroxy-4-methoxy flavone and 6,4 dihydroxy 3'propen chalcone from acetone soluble fraction of methanolic extract. These constituents were isolated for the first time from this plant. The acetone soluble fraction of methanolic extract showed significant antioxidant activity.

Conclusion: From the Pharmacological studies carried out, it is evident that acetone soluble fraction of methanolic extract of S caryophyllatum endowed significant antioxidant activity. The activity may be due to Quercetin, 3,7- Dihydroxy-4-methoxy flavone and 6,4 dihydroxy 3'propen chalcone.

Keywords: *Syzygium caryophyllatum*, Antioxidant, DPPH

2. Antiulcer activity of *Desmostachya bipinnata* in aspirin and histamine-induced ulcers in rats

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Abstract:

Background: Around 10% of the world's populace faces gastric ulcers. Many therapies are available for treating gastric ulcers, but these have side effects when used for an extended period.

Aims: To overcome these problems, new treatments, including herbal medications, should be introduced to replace or decrease drug consumption. Many herbs or medicinal plants are used in the traditional/ayurveda systems to treat ulcers. For the present study, we use the conventional grass *Desmostachya bipinnata* based on their availability and day-to-day use in the various rituals.

Methods: The aqueous extract of *Desmostachya bipinnata* was collected from vital herbs. The antiulcer activity of the extract was evaluated by aspirin and histamine-induced ulcers in rats using omeprazole and ranitidine as standard. The parameters include acidic levels, ulcer index, and biochemical studies. The aqueous extract of *Desmostachya bipinnata* significantly reduced the ulcers compared to the disease group in aspirin and histamine-induced ulcers.

Results: The extract showed similar activity when compared with the standards (omeprazole and ranitidine) in both ulcer models in a concentration-dependent manner, as a high dose (400 mg/kg) has shown more activity when compared with a low dose (200 mg/kg) of extract.

Conclusion: This study concludes the use of *Desmostachya bipinnata* extract as a potential therapeutic agent for treating peptic ulcers without any side effects when compared with the omeprazole and ranitidine used for ulcer treatment in the present day.

Keywords: Aspirin, antiulcer activity, histamine, omeprazole, ranitidine.

3. Evaluation of efficaciousness of hydro-alcoholic extract of *Vitex Agnus castus* administration in metabolic syndrome model in male Wistar rats

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Background: Metabolic syndrome (MetS) is a constellation of diseases characterized by obesity, increased abdominal circumference with elevated blood pressure (both systolic & diastolic), increased blood glucose & insulin resistance, elevated cholesterol, triglycerides, and reduced HDL-cholesterol. Prevalence of metabolic syndrome among adolescents is 5.2%, with higher incidences seen in males as compared to females, with adolescents aged 13-15years having higher odds than 10-12 years ages in the Indian population is a cause of concern since MetS predisposes the adolescent population to an extensive array of adult-onset diseases like cardiovascular diseases. *Vitex Agnus castus* (Chaste berry) fruit reduced serum glucose levels in goldfish and promoted GH and IGF-1 actions. Components of *Vitex Agnus castus* (VAC) have an affinity for the estrogen receptor and have demonstrated downregulation of NF-κB, activation of AMPK, and inhibition of *denovo* lipogenesis. *Vitex agnus castus* in ovariectomized female Wistar rats has reduced the adiposity index and lipid accumulation in liver, and methanolic fruit extract has shown antioxidant and antihyperlipidemic activity, but literature is still lacking on the action of *Vitex Agnus* castus in metabolic syndrome or its components.
Aims: To evaluate the effects of supplementation of hydro-alcoholic extract of *Vitex Agnus castus* on metabolic and biochemical indicators in diet-induced metabolic syndrome model in male Wistar rats
Methods: Forty male Wistar rats (200-250gms) were recruited into five groups (n=8 per group). *Vitex Agnus castus* (VAC) hydro-alcoholic extract was purchased from Green Heaven, Nagpur. Two groups were fed a standard diet (Purina 5L79); one was normal control (NC), and the second was *Vitex Agnus castus* (VAC) control (with a dose of 0.5 mg/kg body weight/day). Third group received a high-calorie-high-fat (HCHF) diet and fructose (60% ,1ml orally/day) for 16 weeks (MetS controls) with induction of metabolic syndrome seen at eight weeks, assessed by Body Mass Index, fasting Blood glucose, Triglyceride, Total cholesterol, LDL-C, HDL-C and serum fasting insulin levels. Fourth group received HCHF diet and fructose for eight weeks and started with VAC extract (0.5 mg/kg body weight/day) with a continuation of HCHF diet and fructose for next eight weeks (post-exposure VAC group). The fifth group received VAC extract (0.5 mg/kg body weight/day) with HCHF diet and fructose for 16 weeks (co-exposure VAC group).
Results: In initial eight weeks, HCHF and fructose increased body weight, abdominal circumference, fasting blood glucose, insulin resistance (HOMA-IR), triglycerides, and reduced HDL-cholesterol ($p < 0.01$) but to a lesser extent in co-exposure groups ($p < 0.01$). At the end of 16 weeks, the groups receiving VAC showed a reduced body weight, abdominal circumference, body mass index, and body fat index compared to metabolic syndrome controls ($p < 0.01$). At 16 weeks, insulin resistance, total cholesterol, Triglycerides, and LDL-cholesterol were lower in groups receiving VAC than metabolic syndrome controls ($p < 0.01$).

Conclusion: *Vitex Agnus castus* administration significantly improves the MetS parameters like insulin sensitivity; reduces body weight, abdominal circumference, BMI, total cholesterol, and triglycerides but shows modest improvement in blood glucose and adiponectin levels.
Keywords: *Vitex Agnus castus*, Metabolic syndrome, High-calorie high-fat diet

4. Cytotoxic and cellular antioxidant activity of *Macrosolen parasiticus* (L.) Danser on U343 human Glioblastoma multiforme cell line

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Backgroud: *Macrosolen parasiticus (L.) Danser* (*M. Parasiticus*) is a parasitic plant seen in western Ghats, India. Recent literatures revealed that it contains flavonoids, phytosterols, phenolic compounds and saponins. Glioblastoma multiforme (GBM) is a common tumour affecting the central nervous system. *Objecives:* to explore the cytotoxic potential of aqueous and methanolic extracts made from the stem of *M .parasiticus* against human glioblastoma (U343) cell line *in vitro*. Further, we also evaluated the effect of extracts on oxidative stress in U343 cells. ***Methods:*** 3-(4, 5-Dimethylthiazol-2-yl)-2, 5-diphenyl-tetrazolium bromide (MTT) and Sulforhadamine B (SRB) assay was performed to assess cell viability. To measure the reactive oxygen species (ROS) of cell 2′-7′-Dichlorodihydrofluorescein diacetate (DCFH-DA) assay was used. Both the aqueous and methanolic extracts showed significant cytotoxicity as compared to control.
Results: Methanolic and Aqueous stem extracts of *M. parasiticus* inhibited the growth of U 343 cell line at a concentration range of 31.25–250 µg/mL. The methanolic and aqueous extracts showed significant cytotoxic activity against U343 Glioblastoma cancer cells by MTT assay. Both the extracts demonstrated a dose dependent inhibition of cell viability with IC50 values of 111.6 ± 3.63 µg/ mL and 69.49 ± 3.45 µg/mL, respectively. In SRB assay, methanolic and aqueous extracts demonstrated dose dependent inhibition of cell viability with IC50 values of 120.8 ± 3.74 µg/mL and 65.16 ± 1.67 µg/mL respectively. The Methanolic and Aqueous stem extracts of *M. parasiticus* were subjected to cellular antioxidant activity by DCFH-DA assay, both the extracts exhibited dose dependent percentage ROS inhibition with IC50 of 141.93 and 93.13 µg/mL. *Conclusion:* In conclusion, the present study offers indication that aqueous and methanolic extracts from the stem of *M.parasiticus* shows anticancer potential against human glioblastoma (U343) cell line *in vitro.* The cytotoxic potential of *M.parasiticus* may be associated to its capacity to inhibit the generation of ROS. Future studies are warranted to explore the anti-apoptotic potential and its effect on various signalling cascade leading to cancer
Keywords: *Macrosolen parasiticus*, DCFH-DA assay, Human glioblastoma, SRB assay

5. Comparative study of citrus fruit juices in in-vitro model of metabolic disorders

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Background: Metabolic disorders include hypertension, hyperglycemia, impaired fat metabolism, and broad waistline. Together, these conditions often lead to metabolic syndrome (MetS), which further results in cardiovascular diseases. Previous studies on citrus fruits have reported beneficial effects like vascular protection, reduction of inflammation, glycemic control etc. on metabolic disorders. These beneficial effects have been linked to the contents present in the fruits like flavonoids, volatile oils, various sugars like sucrose, fructose, glucose, and micro and macro nutrients. However, there has been little research done on the effect of direct fruit juice on metabolic disorders. The beneficial effects of citrus fruit juice can be utilized as an add on for the existing therapy on metabolic disorders, thus achieving faster cure rates.
Aim: to compare a few citrus fruit juices (wild lime, lemon, kino) for their effects on metabolic diseases using *in-vitro* studies.
Objectives:
1. To collect and prepare citrus fruit juices(wild lime, lemon, kino)
2. *In-vitro* study for antihypertensive and antidiabetic activity
3. To quantify ascorbic acid, fructose, and glucose in fruit juices
Methods: Juices of three citrus fruits: lemon, wild lime and kino were extracted and blended. Different concentrations of the same were prepared by dilution method and these concentrations were used to estimate the fructose, glucose, ascorbic acid content and activities like ACE inhibitory activity and α-glucosidase activity. ACE inhibitory activity, Fructose, glucose and ascorbic acid content were estimated spectrophotometrically while α-glucosidase activity was analyzed by microplate reader.
Results: All the three citrus fruit juice showed antidiabetic and antihypertensive activity. Out of the three citrus fruit juices, lemon had the highest ACE inhibitory activity(87.60 ± 2.26%) vs captopril(94.12 ± 0.77%) and wild lime had the highest α-glucosidase activity(48.85 ± 5.45%) vs acarbose(54.85 ± 6.06%). Additionally, concentrations of various sugars were estimated. Kino had the highest fructose content of 459.35± 1.05µg/mL and the highest ascorbic acid content of 1391.16±75.86 µg/mL while lemon had the highest glucose content of 4993.33±47.25.
Conclusion: Citrus fruit juices can be an add on to the existing therapies on metabolic disorders. Wild lime juice has the highest α-glucosidase activity and the lowest glucose levels compared to lemon and kino which makes it he perfect add on for diabetic patients. Lemon has the highest ACE inhibitory activity. Kino has considerable ACE inhibitory activity and the highest amount of ascorbic acid. Moreover, it contains the highest amount of fructose when compared to lemon and wild lime, which can further be consumed by diabetics.
Keywords: Metabolic Syndrome, Citrus fruit juice, ACE inhibition, α-glucosidase activity

6. In vitro and in vivo studies on 5-aminosalicylic acid-induced angiogenesis for wound healing

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Background: A wound is a pathological condition where tissues lose their structural integrity as a result of physical or chemical trauma. Angiogenesis is the process by which blood vessels that are immature, permeable, and redundant grow during the proliferative stage of wound healing. Angiogenesis and vascular permeability are controlled by the VEGF (vascular endothelial growth factor) family and its receptors.
Aim: To study the angiogenic potential of 5-aminosalicylic acid in a diabetes-induced wound model in Swiss albino mice.
Method: Wistar albino rats of body weight 180-220g were procured and housed separately in standard cages (groups of six in a cage) they were habituated to the experimental circumstances for 5 days prior to initiating the experiment. The doses to be given were determined by performing an acute dermal toxicity test. The rats(n=24) were divided into 4 groups consisting of 6 animals each. Group I-Control; Group II received 5-ASA 100mg/kg; Group III- received 5-ASA 200mg/kg; Group IV received 5-ASA 400mg/kg. Both the sponge implants and the rats' deaths were caused by euthanasia. A total of 10 folds of cold, 0.1 M PBS with a neutral pH value were used to homogenize the sponge at 550 rpm for 18 minutes. The following was centrifuged for 20 min at 9,000 rpm at 4 °C. For use in vivo, aliquots of the supernatants were made. The sponge supernatant that had been sonicated was used in the biuret process to quantify the protein. In order to estimate hydroxyproline and hexosamine, tissue hydrolysate was prepared. Calculating hydroxyproline is a reliable way to predict the amount of collagen and the rate of cellular growth.
Conclusion: Our data demonstrated that 5-ASA supplementation enhances tissue repair and encourages angiogenesis, which raises the possibility that 5-ASA may represent an exciting new therapeutic approach for the treatment of wounds.
Keywords: Angiogenesis, wound healing, 5-aminosalicylic acid, vascular endothelial growth factor receptor – 2.

7. PHARMACOLOGICAL EVALUATION OF PPAR-γ AGONISTS AS ANTI-BREAST CANCER AGENTS

ABSTRACT

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Background: Breast cancer is currently the most prevalent malignancy among women in industrialized countries, even in India and being leading cause of global cancer incidence in 2020, with an estimated 2.3 million new cases, representing 11.7% of all cancer cases. As chemotherapy is still being the main strategy for breast cancer treatment, the recent cancer therapies are targeting the mediators that inhibit specific pathways involved in proliferation of cancer cells. Peroxisome Proliferator Activated Receptor – γ (PPAR-γ) agonists activation by Thiazoline diones can inhibit cell migration and angiogenesis, thereby induces apoptosis in cancer cells including breast cancer.

Aim: The aim of this study to evaluate the beneficial effect of PPAR-γ agonist in breast cancer through assessing anti-angiogenic property of selected compound in Swiss Albino mice by 7,12 dimethyl benzene anthracene (DMBA) induced breast cancer model.

Method: In present study, novel PPAR-γ agonists, derivatives of rosiglitazone were studied and found that molecule (5Z)-5-[4-(3-phenoxypropoxy) benzylidene]-1,3-thiazolidin-2,4-dione acting as an active agonist at PPAR-γ receptor which in turn have been reported to activate Phosphatase Tensin homolog (PTEN) protein expression which is a tumour suppressor protein and also inhibits the activation of PI3K/Akt cascade which causes resistance to chemotherapy. *In-vitro* study is evaluated by MTT assay and Chick CAM assay using MDA-MB-231 cell line.

Conclusion: Among different molecules, **(5Z)-5-{4-[3-(bromo-2-fluorophenoxy) propoxy] benzylidene}-1,3-thiazolidine-2,4-dione**, showed a significant cytotoxicity in both in-vitro and in-vivo as well as haematological parameters which may be developed as a therapeutic agent against breast cancer.

Keywords: Breast cancer, PPAR-γ, Thiazoline diones, Anti-cancer activity.

8. PHOSPHODIESTERASE-4 INHIBITION BY ROFLUMILAST LOADED NANO LIPID CARRIERS FOR ATTENUATING NEUROINFLAMMATION IN MPTP INDUCED PARKINSON'S DISEASE MODEL IN WISTAR RATS

ABSTRACT

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Background: Parkinson disease is the second-most common neurodegenerative disorder, affecting 2-3% of the population over the age of 65. The presence of Lewy bodies, which are characterised by the degeneration of nigrostriatal dopaminergic neurons, is the neurological hallmark of Parkinson's disease. The current available treatment in PD can treat only the associated symptoms, but disease modifying drugs that protect neurons and reduce inflammation. Novel PDE-4 inhibitors effectively reversed dopaminergic neuronal death and showed no effect on nausea and emesis. PDE-4 inhibitor Roflumilast, currently FDA approved drug for Chronic Obstructive Pulmonary disease (COPD) was assessed for its effect on attenuating neuroinflammation in the disease progression of PD.

Aim: The present is aimed to evaluate the potential of Roflumilast loaded Nano Lipid Carriers in Phosphodiesterase Enzyme- 4 inhibition for attenuating neuroinflammation in MPTP Induced Parkinson's disease in Wistar Rats.

Methods: The study carry out in-silico molecular docking to compare the binding affinity of Roflumilast, to formulate Nanostructured lipid carriers formulation of Roflumilast for the brain specific delivery. The Roflumilast NLC is assessed for the anti-parkinsonian and anti-neuroinflammatory action of the lead molecule-Roflumilast on MPTP-induced Wistar albino Rats Parkinson's disease model.

Conclusion: Roflumilast NLCs with improved brain-targeted delivery showed better motor deficits also, reduced oxidative stress, neuroinflammation, and degeneration in the MPTP- induced rat model as determined by biochemical estimation and histopathological analysis.

Keywords: Parkinson’s disease, Roflumilast, PDE-4, Nano-structured Lipid Carriers (NLC).

9. EVALUATING THE SYNERGISTIC POTENTIAL OF $TgCN^+$ IN STREPTOZOTOCIN INDUCED RAT ALZHEIMER'S MODEL

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Background: Alzheimer's disease (AD) is a progressive neurodegenerative disorder characterized by cognitive functional decline as it accounts for an estimated 60-80% of cases worldwide. The main feature of AD is the presence of senile plagues and NFT's that causes the atrophy of neurons.
Aim: The present study is attempted to evaluate the beneficial role of Sigma-1 Receptor (S1R) agonist in AD by assessing the neuroprotective activity in-vivo using Lipopolysaccaride (LPS) – induced AD model in male Wistar rats.
Method: The neuroprotective activity of $TgCN^+$ on streptozotocin induced AD model in rats was done for a period of 21 days. Behavioural assessment was conducted for 5 groups each containing 4 animals. Group 1& 2 are grouped as Sham and disease control. Group 3, 4 & 5 received treatment of the test and standard compound doses of different concentrations respectively. The mechanism of action focus on anti-oxidant activity along with anti-inflammatory and also act as an acetylcholinesterase inhibitor, while the hypothesis of the major proportion of test compound trigonelline also proves that it has a neurite outgrowth.
Conclusion: The test formulation $TgCN^+$ proved a increased in memory deficit in Alzheimer's induced rats. The present results conclude that $TgCN^+$ can be therapeutic agent in the treatment of AD.
Keywords: Alzheimer's disease, Sigma-1 receptor, $TgCN^+$, Trigonelline

10. DUAL TARGETING OF PPARY AND COX-2 RECEPTORS TO TREAT NON-SMALL CELL LUNG CARCINOMA IN SWISS ALBINO MICE

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Background: Lung or pulmonary cancer is currently wide spread malignancy and primary cause of death due to cancer, in this Non small cell lung cancer accounts about 85% of total lung cancer. As cancer chemotherapy is still the main treatment for NSCLC but majority of patients suffer from tumour relapse due to chemo resistance in cancer cells by increasing drug efflux. activation of PPAR-y (through PPAR-y agonists) and inhibition of COX-2 (through COX-2 inhibitors) will have beneficial effects in the treatment of NSCLC.
Aim: The present study is aimed to study the anti-cancer potential of PPAR-γ agonist Pioglitazone combined with COX-2 inhibitor Celelcoxib in NSCLC.
Methods: The study group consists of Adult Swiss albino mice and the animals were divided into 6 groups each group containing 10 animals. NSCLC induced in animals by using Nicotine Nitrosamine Ketone (NNK). Group 1and 2 received vehicle which served as sham and negative control respectively. Group 3 and 4 received pioglitazone at two different dose and group 5 and 6 received pioglitazone and celecoxib at two different dose. Different preliminary parameters Such as weekly body weight, mean Survival time, % increase in Life span and tumour weight were analysed.
Conclusion: The significant tumour reducing property of pioglitazone combined with celecoxib was observed ($p<0.05$). The treatment groups (treated with pioglitazone and celecoxib) showed a remarkable changes. They were decrease in lung tumour weight, improved life span and mean survival time ($p<0.05$). Histopathological studies confirm that treatment groups (treated with pioglitazone and celecoxib) reframed the lung architecture compared to disease control. The study observed that pioglitazone alone and combination with celecoxib showed a significant effect on NNK induced changes in body weight, lung tissue weight, MST and % ILS. The study identified that the molecule pioglitazone and celecoxib may be used as a therapeutic agent against NSCLC.
Keywords: Non small cell lung cancer, Pioglitazone, Celecoxib, PPAR-γ

11. EVALUATION OF THE NEUROPROTECTIVE POTENTIAL OF PTPIB RECEPTOR ANTAGONISTS IN ALZHEIMER'S DISORDER

ABSTRACT

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Background: Alzheimer's disease (AD) is the age-related neurodegenerative disease marked by cognitive and behavioural impairment with worldwide prevalence is as high as 55 million suffering from dementia, mostly suffer from AD. Protein-tyrosine Phosphate 1B (PTP1B) receptor encoded by the PTPN1 gene in humans, which has the potential role in modulating inflammation and involved in BDNF (Brain Derived Neurotrophic Factor) pathway. The inhibition of PTP1B will help to promote BDNF signalling in hippocampus and cortex region in brain enhancing neuroprotective activity.
Aim: The present study is aimed to analyse the neuroprotective potential of PTP1B antagonist as a novel therapeutic strategy for the treatment of AD.
Methods: The study carries out structure based virtual screening of ZINC database molecules against PTP1B binding domain to identify suitable PTP1B antagonists. The molecular docking and molecular dynamics is used to predict the binding conformation of the PTP1B antagonist with that of the target binding site (1PXH). The in-vivo neuroprotective potential of selected PTP1B antagonist against Lipopolysaccharide (LPS) induced AD model in Wistar Rats.
Conclusion: The present study results show that ZINC 00002974100 may be used as a therapeutic against AD. The possible mechanisms may include the downregulation of PTP1B receptor that inhibits Nf-kB pathways preventing recruitment of pro-inflammatory mediators that causes neuronal cell survival and neuroprotection.
Keywords: Alzheimer's disease, PTP1B, Molecular docking, Neuroprotection

12. SOLID LIPID NANAOCARRIERS OF γ-SECRETASE INHIBITOR, DAPT FOR TREATMENT OF BREAST CANCER

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Background: The most typical cancer in women is breast cancer, particularly in less developed areas. It has surpassed cervical cancer to take the top spot on the list of cancer-related fatalities among Indian women. Breast cancer stem cells (BCSCs), which are resistant to treatment and encourage spread, present the biggest problem. Although promising, -secretase inhibitors could injure healthy tissue. In recent studies, these inhibitors have been delivered using solid lipid-based nanocarriers (SLNs), which increases drug concentration at the tumour site due to the increased permeability and retention (EPR) effect.
Aim: The aim of this study is to develop DAPT-loaded solid lipid nanocarriers for treating of breast cancer.
Method: In this experiment, mice given 40 mg/kg of DMBA (5 mg/ml in maize oil) orally once a week for five weeks. Mice were placed into four groups of six each after tumour development. After the DMBA induction, mice received treatment for two weeks that included paclitaxel (2 mg/ml in 0.5% CMC), DAPT (1.0 mg/ml in saline), and DAPT-SLN (1.0 mg/ml in saline). The tumours were fixed in 10% formalin for histological inspection after the study, and blood samples were taken for haematological investigation.
Result: the treatment with DAPT-SLNs at a dos of 10mg/kg i.v showed a significant reduction in both tumor volume and percentage tumor regression when compared to disease control group ($p<0.05$). these results were superior to paclitaxel (10mg/kg.p.o) and DAPT (10mg/kg i.v)
Conclusion: In this study, DAPT, a gamma-secretase inhibitor, was developed with the goal of enhancing its anticancer properties. In both in vitro and in vivo testing, the SLN formulation beat both the bulk medication and the industry standard, PTX. This suggests that DAPT-SLN has a stronger anticancer potential while causing the least amount of bone marrow damage.
Keywords: breast cancer, breast cancer stem cells (BCSCs), Notch signalling system, solid lipid-based nanocarriers (SLNs).

13. PRELIMINARY EVALUATION ON THE BENEFICIAL EFFECTS OF PIOGLITAZONE IN THE TREATMENT OF ENDOMETRIAL CANCER

ABSTRACT

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Background: More than three million women worldwide are affected by endometrial cancer (EMC), one of the most difficult gynecological cancers. Chemotherapy, radiation therapy, and surgery are anticancer treatments that have been demonstrated to be ineffective and to be linked to patient noncompliance. Peroxisome Proliferator-Activated Receptor – γ (PPAR-γ) agonist activation can inhibit cell migration and angiogenesis, thereby inducing apoptosis in cancer cells including endometrial cancer.

Aim: The aim of the present study is to repurpose a non-oncological drug, i.e., Pioglitazone, a peroxisome proliferator-activated receptor gamma (PPAR-γ) agonist, in the treatment of endometrial cancer.

Methods: In this study, a non-oncological medication called Pioglitazone, a PPAR-gamma (peroxisome proliferator-activated receptor-gamma) agonist, will be used to treat endometrial cancer. The study groups are made up of 50 female Swiss albino mice, 40 of whom were given N-ethyl-N-nitrosourea (ENU) and estradiol hexadrobenzoate (EHB) to promote endometrial cancer. Saline, EHB, paclitaxel, and various test dosages of pioglitazones were administered to the other groups. Along with histopathology data, many preliminary metrics were examined, including weekly body weight, mean survival time, the percentage increase in life span, and uterine tissue weight.

Conclusion: Pioglitazone exhibits a significant dose-dependent anticancer effect in the current investigation against ENU- and EHB-induced EMC in contrast to regular PTX. The study concludes that pioglitazone offers a novel method of controlling EMC using interference that is mediated by adipokines.

Keywords: Endometrial carcinoma, PPAR-γ agonist, Pioglitazone, Adipokines

14. EVALUATION OF IN VIVO EFFICACY OF SOLUBLE EPOXIDE HYDROXYLASE INHIBITOR, t-TUCB IN ISOPROTERENOL INDUCED MYOCARDIAL ISCHEMIC INJURY IN RATS

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Background: Ischemic heart diseases (IHD) were identified as major contributors to CVD-related mortality, underscoring the urgent need for effective interventions. Epoxyeicosatrienoic acids (BETs) were introduced as potential agents for shielding against ischemic conditions, with a focus on inhibiting soluble epoxide hydrolase (she) to increase BETs availability as an innovative cardio protective strategy. The mechanisms through which BETs function, including amplification of ion channel activity, conservation of ATP use, and activation of anti-apoptotic pathways, were explained. The she inhibitor t-TUCB was introduced as a more stable and bioavailable option compared to its predecessors. The study's specific goal to evaluate the cardio protective potential of t-TUCB against isoproterenol-induced myocardial ischemic injury in rats was outlined.
Aim: The aim of this study is to assess the potential cardioprotective effects of the she inhibitor trans-4-4-{3-(4trifluoromethoxy-phenyl)-ureido-cyclohexyloxyl-benzoic acid (t-TUCB) in rats subjected to isoproterenol induced myocardial ischemic injury.
Methods: The study employed in silico docking using Schrödinger's Maestro 9.3 on a Windows 7 workstation. The human she crystal structure (PDB entry 3K00) complexed with 24D was used. Proteins were prepared, optimized, and energy-minimized. Ligand structures were generated in MOL format using ChemDraw Ultra 12.0 and preprocessed with LigPrep. Compound t-TUCB was manually docked in the ligand-binding pocket. Glide 9.3 in extra precision mode was used for docking. Spectral characterization included IR and LC-MS analysis. Acute toxicity was assessed in mice at 2000 mg/kg, following OECD Guideline 423. Test compound 1-TUCB was prepared in PEG400 and water. Myocardial infarction was induced in rats with ISO. Animal groups received different doses of t-TUCB or vehicle, with ISO administered to all except the Normal group.
Systolic BP, EKG, and biochemical parameters were monitored.
Conclusion: This investigation highlights the promising potential of the sEH inhibitor t-TUCB in providing cardio protection against isoproterenol-induced myocardial ischemic injury. The enhanced stability and bioavailability of t-TUCB compared to earlier inhibitors signify a significant advancement in this field. This study paves the way for further research and potential therapeutic interventions for ischemic heart diseases.
Key words: She- soluble epoxide hydrolase , t-TUCB

15. EVALUATION OF NEUROPROTECTIVE POTENTIAL OF SIGMA-1 RECEPTOR AGONISTS IN ALZHEIMER'S DISORDER

ABSTRACT

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Background: Alzheimer's disease (AD) is a widespread neurocognitive disorder and it's hallmarks include amyloid plaques and neurofibrillary tangles. The therapeutic options remain symptomatic, necessitating exploration of novel targets like the Sigma-1 Receptor (SIR) for neuroprotection. SIR, situated in the mitochondrion-associated endoplasmic reticulum membrane, plays a vital role in cellular survival signalling pathways, regulating and influencing diverse neuronal functions.

Aim: The aim of this study is to screen ZINC database for SIR agonists (FDA approved, Investigational drugs), docking studies (6DKI site), and assessing neuroprotective effects in AD-induced Wistar rats with chosen agonist.

Method: The study utilizes in-silico methods, employing Schrodinger software, to screen ZINC database molecules against SIR. The highest scoring compound is selected and molecular dynamics to predict the binding of the chosen compound to the target site was performed. The in-vivo study using Wistar rats was performed to assess the neuroprotective potential of the selected compound. Histopathology, behavioral assessment, and biochemical parameter estimation was done followed by statistical analysis.

Conclusion: The present results show that ZINC000095619101 may be used as a therapeutic agent against AD. The possible mechanisms may include the stimulation of SIR that causes the stimulation of PI3/Akt/mTOR pathway, inhibiting recruitment of pro-inflammatory mediators thus causing neuronal cell survival and neuroprotection. Further studies and more research needs to be done to know the exact genes and proteins through which this neuroprotective effect occurs.

Keywords: Alzheimer's disease (AD), Sigma-1 receptor (S1R), Neuroprotection, Molecular Docking

16. NEUROPROTECTIVE EVALUATION OF AMITRIPTYLINE IN ROTENONE-INDUCED MICE MODEL OF PARKINSON'S DISEASE

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Background: Parkinson's disease (PD) is a complex neurodegenerative condition characterized by diverse symptoms beyond the classic loss of dopaminergic neurons and Lewy bodies. Its origins involve a complex interplay of genetic and environmental factors affecting various cellular processes. Disruptions in neuronal signalling pathways, influenced by internal and external factors, impact nuclear integrity, energy metabolism, and mitochondrial structure. Brain-derived neurotrophic factor (BDNF) plays a crucial role in maintaining dopaminergic neurons. Lower levels of neurotrophic factors like NGF, GDNF, and BDNF in PD have led to investigations into their therapeutic potential, benefiting dopaminergic neurotransmission and neuronal survival in animal models. Amitriptyline, a tricyclic antidepressant, has shown promise in increasing BDNF levels and may offer neuroprotection in neurodegenerative models. The binding of BDNF to TrkB activates intracellular tyrosine kinase activity, initiating MAPK, PLC-γ, and PI3K pathways. This activation of CREB enhances BDNF and BCL-2 gene expression, promoting neuronal survival, synaptic plasticity, and neurogenesis.
Aim: The aim of this study is to investigate Amitriptyline's binding to TrK A & B proteins through in silico molecular docking analysis and its impact on a Parkinson's disease mice model induced by rotenone, including assessing behavioural parameters and neurobiochemical levels.
Method: The study was initiated with a comprehensive literature review and the design was formulated. In silico molecular docking analysis using PyRx 0.8 was employed to investigate Amitriptyline's binding affinity to TrK A and B, utilizing protein structures (TrKA: 1WWW, TrkB: IHCF) and ligands (Amitriptyline, Gambogic amide, 7,8 dihydroxy flavone) obtained from databases. For in-vivo experiments, male Swiss Albino mice (25-30g) underwent a 7-day acclimatization period in standard laboratory conditions with 12-hour light/dark cycles, normal diet, and water access. The study was conducted following approval from the Institutional Animal Ethics Committee (IAEC), involving 24 mice distributed into four groups: Control, Rotenone, Rotenone with Amitriptyline (5 mg/kg), and Rotenone with Amitriptyline (10 mg/kg). Amitriptyline pre-treatment for seven days preceded a 21-day rotenone induction, with Amitriptyline continued one hour before induction. Behavioural assessments included rotarod and catalepsy tests, and neurobiochemical analyses involved reduced glutathione, catalase, and superoxide dismutase estimation. Histopathological evaluations were carried out, and statistical analysis was performed using ANOVA tests.
Conclusion: Amitriptyline, an alternative TrK receptor agonist, shows promise in treating neurological disorders like Parkinson's disease. Neurotrophins like NGF and BDNF have potential but face limitations due to low blood-brain barrier permeability and adverse effects. Amitriptyline activates TrkA and TrkB receptors, mimicking neurotrophic factors, and effectively reverses neurobiochemical and behavioural effects in a rotenone-induced PD model. Further research is needed to elucidate Amitriptyline's precise neuroprotective mechanism.

Keywords: TrK (Tropomyosin receptors),
BDNF (Brain-derived neurotrophic factor)
MAPK (Mitogen-activated protein kinase)
PLC-γ, and PI3K pathways (Phospholipase C-gamma) and Phosphatidyl inositol 3- kinase)

17. EVALUATION OF CHITOSAN-PVA SCAFFOLD IMPREGNATED WITH FORMONONETIN NANOSTRUCTURED LIPID CARRIERS FOR DIABETIC WOUND HEALING

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Background: Diabetes Mellitus (DM) is a chronic metabolic disorder characterized by prolonged hyperglycemia, affecting 422 million people globally. Genetic, environmental, and lifestyle factors contribute to its prevalence, with Type 2 DM being the most common. It results from insulin insufficiency or resistance, leading to various complications, including neuropathy, retinopathy, nephropathy, cardiovascular diseases, and diabetic foot ulcers (DFUs).
DFUs affect 20% of the global population, with rising incidence due to inadequate preventive measures. DM consumes a significant portion of global health budgets, with DFUs being a major contributor. These ulcers occur in 15% of diabetic individuals and are a primary cause of hospitalization and amputations, accounting for 50% to 70% of amputations worldwide. Scaffolds play a crucial role in diabetic wound management. Traditional dressings like gauzes and cotton offer limited benefits, while tissue engineering introduces innovative solutions. These include 3D-porous matrices, hydrogels, microspheres, and nanofibers designed to enhance wound healing and infection control.
Aim: To evaluate the effect of Formononetin loaded Chitosan -PVA Scaffolds in Streptozotocin induced rats for Diabetic wound healing.
Method: The research plan consists of nine stages. Stage 1 involves an extensive literature survey from International and National journals, as well as online resources. Stage 2 focuses on the selection of drug and polymers. Stage 3 emphasizes obtaining Approval from the Animal Ethical Committee. Stage 4 aims at developing a calibration curve for Formononetin. Stage 5 involves the formulation of Chitosan-PVA scaffolds with Formononetin nanolipid carrier using the microemulsion technique. Stage 6 includes characterization of the prepared scaffolds, assessing porosity, water absorption, matrix degradation, and in-vitro drug release. Stage 7 focuses on in-vitro cytotoxicity studies using L.929 cell lines. Stage 8 involves in-vivo wound healing studies, including wound contraction, Hydroxyproline estimation, Hexosamine estimation, and Histopathological studies. Finally, Stage 9 encompasses statistical analysis.
Conclusion: Formononetin, an isoflavone derived from plants like Trifolium pratense and Astragalus membranaceus, exhibits phytoestrogenic properties, acting through estrogen receptors. It was encapsulated in NLCs for sustained drug release. Chitosan and PVA polymers enhanced biodegradability and mechanical strength, facilitating diabetic wound healing. Solubility and purity were determined through solid dispersion and calibration curve methods, respectively. In vitro studies demonstrated high drug release percentages. MTT assay revealed low cytotoxicity. Formononetin-loaded Chitosan-PVA scaffolds promoted wound healing with increased Hydroxyproline and Hexosamine content, collagen deposition, fibroblast migration, and re-epithelialization. This study suggests Formononetin-loaded CS-PVA scaffolds as promising for diabetic wound treatment.
Keywords: Diabetic Foot Ulcer (DFU), Diabetes Mellitus (DM), Streptozotocin (STZ), Chitosan (CS), Formononetin (FMNT), Nanostructured Lipid Carriers (NLC`s)

18. A preclinical study to investigate the effect of carvedilol against DSS-induced colitis in mice

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Background: Inflammatory bowel disease (IBD) is an idiopathic, chronic inflammatory condition involving abdominal cramps, persistent diarrhoea, rectal bleeding, and weight loss. It includes Crohn's disease (CD) and Ulcerative colitis (UC). CD exhibits characteristic skip lesions with inflammation affecting any part of the gastrointestinal tract from the proximal ileum to the colon. UC is characterized by continuous lesions from the rectum to the proximal colon. Untreated IBD can lead to extraintestinal manifestations such as arthritis and cirrhosis. It has been observed that IBD is more prevalent in developed countries than in developing countries. Amino salicylates are considered a first-line treatment, followed by corticosteroids, immunomodulators and biological agents, but none are promising. Lack of treatment regimen with constant relapse are major voids in the management of IBD. On the other hand, drug discovery needs large expenses and more time; hence, repurposing drugs is a viable and better alternative. Carvedilol, a beta-blocker, is the most trusted agent used in cardiovascular disorders and acts by reducing the oxidative stress. Considering the potential of carvedilol to inhibit NLR family pyrin domain containing 3 (NLRP-3) inflammasome, which plays a crucial role in the pathogenesis of IBD, its protective activity can be further investigated in colitis.
Aim: To study the effect of carvedilol in DSS-induced colitis in mice.
Method: Forty Balb/c male mice were procured from Central Animal Research Facility, Manipal Academy of Higher Education (MAHE), Manipal (IAEC/KMC/141/2020). The animals were divided into 4 groups of normal control, disease control (4% Dextran sodium sulphate (DSS in drinking water), standard group (4% DSS+ mesalamine 200mg/kg), carvedilol group (4% DSS+4mg/kg) and dosed for 14 days. The 4% DSS was administered from day 10 to 14. Disease activity index (DAI) was calculated from weight loss, stool consistency, and rectal bleeding. Animals were sacrificed after day 14, and colon samples were isolated and stored at -80°C until further biochemical and histopathological examinations.
Results: The DAI was significantly increased in disease control and was reversed by carvedilol. The colon length was significantly reduced in disease control, which was unaltered in the treatment groups. The oxidative stress and inflammation were elevated in the disease group as manifested by a significant increase in malondialdehyde and interleukin (IL) -6 levels. Treatment with mesalamine significantly reduced the elevated oxidative stress and inflammation, but carvedilol did not show a significant reduction. The histopathological examinations revealed that carvedilol prevented DSS-induced tissue architectural disruption and reversed the decrease in the number of cysts, crypts, and goblet cells.
Conclusion: The present study proved the effectiveness of carvedilol against DSS-induced colitis by reducing DAI and histopathological changes in Balb/c mice.
Keywords: Ulcerative colitis, DSS-induced colitis, carvedilol.

19. FREE RADICAL SCAVENGING AND ANTIBACTERIAL ACTIVITIES OF ALCOHOLIC EXTRACT OF CASSIA AURICULATA FLOWER

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Background: Essential chemicals for treating diseases, such as antibiotics for bacterial infections, are found in medicinal plants. The damaging effects of excess free radicals in diseases like diabetes on organs highlight the importance of control and knowledge in medicine. C. auriculata is a multifunctional plant with antipyretic, hepatoprotective, antidiabetic, antiperoxidative, and microbicidal properties. It also has antiviral effects and is used in traditional medicine for various ailments, including female antifertility, leprosy, worms, diarrhea, and conjunctivitis.
Aim: The aim of the study is to investigate the preliminary identification test for *cassia* auriculata flower extract and determine its biological activities.
Methodology: The DPPH Free Radical Scavenging Assay assesses the antioxidant compounds' ability in SA i and SA ii samples to neutralize free radicals by measuring discoloration, indicating their hydrogen-donating potential. The antibacterial properties of the Cassia auriculata flower extract were evaluated using the disc diffusion method.
Results: The extract displayed strong antibacterial activity at 2000 µg/ml but no activity at 500 µg/ml. It was particularly effective against Staphylococcus aureus and Pseudomonas aeruginosa at 2000 µg/ml while showing less impact on Escherichia coli compared to 1000 µg/ml. Additionally, it exhibited significant inhibition percentages at 80 µg/ml, 40 µg/ml, and 100 µg/ml in comparison to 10 µg/ml and 20 µg/ml.
Conclusion: The alcoholic extracts of Cassia auriculata flower revealed antibacterial activity in the current study, as well as free radical scavenging activity. The extract's inhibitory effect justified Cassia auriculata's potential as a medicine, further study is needed to discover the Cassia auriculata flower's active component.
Keywords: Anti-bacterial, DPPH Free radical, cassia auriculata, Hot Soxhlet Extraction method, invitro studies

20. A Low-Grade Electric Field Application and Chemotherapy Minimized Glioma Burden along with Improving Cognitive Parameters

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Abstract

Background: Glioblastoma is a malignant tumor with several cells protruding deep into the cerebral lobes of the brain. Temozolomide is the standard drug used in glioma treatment. The main disadvantage is that it easily crosses the blood-brain barrier and causes direct toxicity to normal brain cells. The adoption of electric field has proven to be a beneficial therapy in the treatment of glioblastoma, and research continues to develop better electrotherapy to treat brain tumors.

Aim: The aim of this study was to evaluate the effect of low-intensity electric field stimulation on temozolomide treatment in C6-induced glioblastoma multiforme.

Methods: Male Wistar rats, weighing 200-250g were used in this study. Animals were randomized into five groups with 8 animals per group. Stereotaxic surgery was performed on the animals and the treatment was given according to the designed schedule. Normal control received Carboxymethylcellulose (CMC) (0.25% w/v, po), C6 control received CMC (0.25% w/v, PO), temozolomide control (temozolomide 20 mg/kg, IP for 28 days in 5 days cycle), electrical stimulation (80 pulses/sec, applied topically to the scalp for 28 days), electrical stimulation + temozolomide (80 pulses/sec, applied topically to the scalp + 20 mg/kg, IP). Behavioral assessment was performed by the passive avoidance test.

Actophotometer was used to assess the locomotor activity. Antioxidant estimations of the hippocampus and frontal cortex were performed. Histology of the tumor, hippocampus, and frontal cortex was also done.

Results: Compared to the disease control group, the treatment groups showcased a significant reduction in the time spent in the dark cell, except for the temozolomide group in the passive avoidance experiment. Among the treatment groups, only the electrical stimulation group showed a significant improvement in locomotor activity compared to the disease control group. Histopathological and antioxidant results also confirmed the determined tumor as well as behavioral parameters.

Conclusion: Low-grade electrical stimulation has shown promising results in the treatment of glioblastoma multiforme. However, molecular pathways can be investigated to support the data.

Keywords: Glioblastoma, Temozolomide, Electrical stimulation, Tumor.

21. Effect of Oil Extract of Jasminum grandiflorum Linn Leaves on Burn Wound Infection by Pseudomonas Aeruginosa in Rats

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Background*:* Jasminum grandiflorum Linn (Jg) is used in various formulations that are used in treatment of wounds in Ayurveda. Present study has undertaken to see the effect of oil extract of Jg leaves in burn wound model infected with Pseudomonas aeruginosa.

Objective: To study the effect of topical application of oil extract of Jasminum grandiflorum on P. aeruginosa infected burn wound model in adult Wistar rats.

Materials and Methods: Three groups of adult Wistar rats [1 – Control, 2 – Standard (topical silver sulfadiazine), Test (oil extract of Jg; topical)] were used. Preparation of oil extract of Jg, done according to traditional methods. Burn wound models were induced as per standard procedure. Wounds were infected by topical application of P. aeruginosa suspension containing 1 x 108cfu. Topical application of oil was started from day1 till day 21. Parameters assessed: Percentage of wound contraction and period of epithelization. Statistical analysis: Data was analyzed by one-way ANOVA using SPSS 16.0.

Results: Application of oil extract to infected burn wound model has shown a significant increase in wound contraction rate [$p<0.05$] on day 14 and 16 and decrease in periods of epithelization ($p< 0.001$) on day 18 when compared to control group. The results obtained were not significant as that of standard group.

Conclusion: Results of the study shows that topical application of oil extract of Jg leaves has wound healing effect in infected burn wound model

Keywords: Jasminum grandiflorum, oil extract, P. aeruginosa, wound healing

22. Anti-tumor effect of liposomes encapsulating Levamisole and Lipopolysaccharide in 1, 2-Dimethylhydrazine dihydrochloride (DMH) induced colon cancer

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Background: Levamisole (LEV), a known anti-helminthic, was earlier indicated as an immune adjuvant in Stage II and III resected colon cancer. Although its exact mechanism is unknown, LEV is known to be a thymomimetic agent that produces T-cell mediated immune responses, thus acting as a suitable adjuvant in associated with 5-FU. However, considering its limited contribution based on earlier clinical trials, a combination of LEV with Lipopolysaccharide (LPS) has not been investigated until today. LPS is known to be an endotoxin capable of activating innate immune responses which may be a suitable incorporation in a pro-tumorigenic microenvironment. This combination may very well produce pro-inflammatory immune responses that could potentially contribute to colon tumor reduction.
Aims: This study focuses of evaluating the in vivo anti-tumor activity of liposomes encapsulating LEV and LPS in DMH induced colon cancer
Methods: Liposomes were prepared by thin-film hydration method. A lipid film made up of Soy phosphatidylcholine and Cholesterol (3:1) was prepared in a round bottom flask under vacuum. Post 24h desiccation the film was hydrated with drug solution containing LEV (10mg) and LPS (0.002mg) that is prepared either alone or in combination and further probe sonicated to produce homogenous liposomal formulation. The prepared formulation was further investigated for its anti-tumor effect in DMH induced colon cancer. Male Wistar rats were chosen for this study. All animals used in the study were obtained post-approval from Institutional Animal Ethics Committee (IAEC), Kasturba Medical College, Manipal. DMH, a known carcinogen, was freshly prepared in 1mM/L EDTA -normal saline and adjusted to pH 6.5 and was injected at a dose of 20 mg/kg i.p. for 8 weeks followed by 30mg/kg i.p. for another 8 weeks. The development of colonic polyps in the proximal and distal colon determines the initial stages of colon tumor development. Post induction, a 21-day treatment of free drugs and formulation (p.o.) combined with 5-FU (i.p.) was scheduled. For assessment, tumor parameters such as Aberrant Crypt Foci (ACF) incidence and count, hematological components in blood plasma, oxidative stress markers and histopathological alterations in the colon tissue was considered. Statistical Analysis was performed to identify significance in different groups by one-way ANOVA using GraphPad Prism (v.8) software.
Results: A 21-day administration of formulation with 5-FU showed meaningful results. The combination displayed significant reduction in ACF incidence and count($p<0.05$). Hematological components, WBC, monocytes, and lymphocytes demonstrated a positive trend in their production in formulation groups compared to DMH group. Similarly, oxidative and nitrergic stress markers as well as histopathology indicated a therapeutic effect with a significance of $p<0.05$.
Conclusion: In-vivo results revealed that LPS incorporation in liposomal formulation along with levamisole might be a useful approach to treat colon cancer as an immunomodulatory strategy i.e.

by activating both innate and adaptive cell mediated immunity thus contributing to tumor reduction.

Keywords: Liposomes, Colon cancer, Levamisole, Lipopolysaccharide

23. PRECLINICAL EVALUATION OF IKK AND GLUTAMINOLYSIS INHIBITORS IN THE TREATMENT OF PSORIASIS USING COMBINATION DRUGS

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Background: An autoimmune skin condition known as psoriasis causes patches of skin that are red, scaly, and frequently itchy. Despite there are several therapies for psoriasis, they are not always helpful for all individuals, and some may encounter unfavourable side effects. Patients also differ in their preferences for the way that therapy is administered. To fulfil patient's unique requirements and preferences and to deliver better, safer, and more affordable treatments, new therapies are required. The lives of those who suffer with psoriasis may be improved, and they may be able to better control their illness, with the development of new medicines.
So, my theory focuses on inhibiting IKK and glutaminolysis, which may have therapeutic effects and can minimize the inflammation and psoriatic symptoms.
Aim: To evaluate in-vivo anti-psoriatic activity of Chrysin and Metformin combination in Imiquimod induced psoriasis in mice.
Methods: Swiss albino female mice (8–10 weeks old, 21–28g) were selected and were kept under stringent hygiene standards. Animals were divided into five groups - Normal control, Disease control, Low dose, high dose treatment and Standard. Induction of Psoriasis was done using the Imiquimod 5% on shaved dorsal skin of mice for 7 consecutive days. Parameters which were evaluated - PASI score of erythema, scaling and thickness, splenomegaly assessment, histopathological analysis and statistical analysis.
Results: The mice's dorsal skin in the disease-control group had significant erythema, scaling, and thick scales. Both the low dosage and high dose treatment groups had decreased erythema, scaling, and skin thickness. However, the high dose group displayed much reduced scaling, erythema, and skin thickness when compared to the low dose group. Results from the high dose group were comparable to those from the standard group. Spleen size was significantly expanded in the diseased control group, while it was pretty normal in the treatment groups.
The spleen size in the high dose treatment group was the smallest when compared to the low dose treatment group. The spleen sizes in the high dose treatment group and the standard group were comparable. The dorsal skin tissue in the disease control group had the highest levels of acanthosis and epidermal hyperkeratosis, according to histopathological investigation. The high dose treatment and standard group had the least hyperkeratosis and acanthosis.
Conclusion: The current research showed that a high dose of combination medications (Chrysin 100 mg/kg, p.o. + Metformin 200 mg/kg, p.o.) shows potential in lowering inflammatory and psoriatic symptoms in mice. This preclinical witness suggests that blocking the IKK pathway and glutaminolysis may have the pharmacological effect of regulating cytokine production and immune system response, which makes it potentially beneficial as a psoriasis alternative therapy approach. Additional research is necessary to test acute and chronic toxicity in animal models before starting a clinical trial.

Keywords: Psoriasis; erythema; Imiquimod; IKK; glutaminolysis; inflammation; Chrysin; Metformin.

24. Effect of Berberine, an AMPK activator, on lipopolysaccharide induced neuroinflammation in Swiss albino mice

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Background:

In rodents, peripheral administration of lipopolysaccharide (LPS) triggers certain immune reactions that cause acute sickness behavior. Sickness behaviour, which resembles depressive-like state, appears as decreased movement, tiredness, cognitive decline, and an inability to enjoy otherwise normally pleasurable situations. Though the exact mechanism is not known, it is assumed that LPS binds to Toll-like receptors and activates the NF-κB pathway resulting in the release of proinflammatory cytokines that can induce sickness behavior. AMPK has been identified as an essential regulator in neuroinflammation, that activates anti-inflammatory systems. In rodent models of LPS-induced memory deficit, the arrest of inflammation by suppression of NF-κB release and improvement in memory deficits by metformin has been proven to be mediated via AMPK activation. Currently, AMPK activators are being evaluated as drug candidates for conditions involving neuroinflammation. Berberine, an alkaloid, shows pharmacological activity against several inflammatory diseases, which is partially attributed to its ability to activate AMPK. However, the effect of berberine on neuroinflammatory responses is poorly understood. This study was designed to explore the potential of berberine against LPS-induced sickness behavior in Swiss albino mice.

Aims:

To assess the effect of berberine on LPS-induced sickness behavior in Swiss albino mice using open field test (OFT) and forced swim test.

Methods:

Swiss albino mice (20-30g) were administered berberine (100 mg/kg b.w., perorally) and the comparator treatment – metformin (200 mg/kg b.w.) for 7 days. On day 7, one hour after the drug administration, a single dose of LPS (1.5mg per kg of bodyweight) was injected intraperitoneally to induce sickness behavior. 1hour later, open field test (OFT) and forced swim test (FST) were performed. 3h later, animals were euthanized, and the oxidative stress markers in the brain were estimated.

Results:

The single dose of LPS significantly decreased the locomotor activity in OFT and FST. Pretreatment with metformin and berberine did not improve the decreased locomotor activity induced by LPS. However, in FST, metformin and berberine significantly improved the immobility. Metformin showed significant improvement in lipid peroxidation, GSH levels and decreased the levels of IL-1β. However, berberine failed to demonstrate any effect on brain antioxidant biomarkers and cytokine levels.

Conclusion:

The current study indicates that berberine may not have significant activity in LPS induced sickness behavior in mice, compared to the standard AMPK activator, metformin.

Keywords:

Sickness behavior, neuroinflammation, berberine

25. Exploring therapeutic potential of Benincasa hispida and Aloe barbadensis extracts on obesity-linked inflammatory bowel disease: A preclinical approach.

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Abstract:

Background: Chronic inflammatory conditions of the gastrointestinal tract, such as Crohn's disease and ulcerative colitis, that are majorly influenced by genes, environment, and immune system, are collectively referred to as inflammatory bowel disease (IBD). This study is an attempt to explore the effect of microplastics on health and to assess whether they lead to conditions like obesity and IBD. Exposure to Microplastic (MP) is very common in present-day scenarios, thus, we chose these two as an inducing agent.

Objectives: The goal of this study was to look into the potential therapeutic benefits of Benincasa hispida Thunb and Aloe barbadensis extracts in treating IBD linked with obesity.

Results: In the pilot study the microplastic-treated group showed a significant reduction in body weight and altered biochemical parameters Subsequently, in the experimental study, Benincasa hispida (BH) and Aloe barbadensis extracts were studied for obesity-related IBD. the microplastic groups showed a significant decrease in body weight which gradually came to normal when treated with BH and Aloe extract. In order to evaluate the changes in lipid metabolism brought on by IBD and obesity, fecal lipid analysis was done, revealing information about potential therapeutic targets and mechanisms. While treatment groups displayed lessened congestion and inflammation, histopathological analysis of the liver and intestine revealed inflammatory changes from microplastic treatments.

Conclusion: Considering the results obtained, we conclude that Benincasa hispida Thunb and Aloe barbadensis extracts can be potential candidates and can be preferred in managing obesity-related inflammatory bowel disease. Further, there is scope to assess the underlying mechanisms and clinical uses of these extracts.

Key Words: IBD, Obesity, Benincasa hispida, Aloe barbadensis, MP, Crohn's disease, Ulcerative colitis

Poster Presentations

Stream 5

FORMULATION AND TRANSLATIONAL RESEARCH

1. A Mother's Nutritional Edge: Investigating the Influence of Prenatal Docosahexaenoic Acid (DHA) Supplementation on Pregnancy Outcomes – A Systematic review and meta-analysis.

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Background: Docosahexaenoic acid (DHA), an omega-3 long-chain polyunsaturated fatty acid (LCPUFA), has been proposed to improve pregnancy outcomes, including infant birth weight and gestational duration, while reducing the incidence of preterm births. Maternal DHA intake during pregnancy is well-known for promoting infant cognitive development. However, findings from randomized supplementation trials using various sources and doses of omega-3 LCPUFAs have yielded inconsistent results.

Aim: This systematic review and meta-analysis aimed to determine the effect of prenatal DHA supplementation on pregnancy outcomes.

Methods: Following PRISMA 2020 guidelines, we searched PubMed, EMBASE, and Google Scholar for relevant randomized controlled trials (RCTs) using specific search terms related to DHA, prenatal supplementation, pregnancy, preterm birth, birth weight, infant, and gestational duration. We included RCTs that examined the effects of maternal DHA supplementation during the latter half of pregnancy on infant birth weight, gestational duration, and preterm birth prevalence. Risk of bias assessment and data synthesis were conducted based on predefined criteria.

Results: Nine RCTs were included in this review. Prenatal DHA supplementation at doses exceeding 400 mg/day was associated with a slightly higher birth weight, but the effect was statistically insignificant ($p = 0.01$, $I2 = 51\%$). There was also a slight, statistically insignificant reduction in the number of infants with low birth weight ($p = 0.19$, $I2 = 47\%$). The increase in gestational duration with DHA supplementation was statistically insignificant ($p = 0.55$, $I2 = 100\%$), as was the reduction in the number of preterm births ($p = 0.23$, $I2 = 0\%$).

Conclusion: The available evidence suggests that prenatal DHA supplementation may have the potential to reduce the risk of preterm births and increase infant birth weight, particularly at doses exceeding 400 mg/day. However, due to the limited nature of available evidence and the inconsistent findings from previous trials, further research is required to strengthen these conclusions and establish the optimal dosage and potential benefits of DHA supplementation during pregnancy.

Key words: Prenatal DHA supplementation; Pregnancy outcomes; Birth weight; Preterm birth

2. DEVELOPMENT AND VALIDATION OF A REVERSE PHASE HPLC BIO-ANALYTICAL METHOD FOR THE ESTIMATION OF MANGIFERIN IN MICE PLASMA

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Background: Mangiferin, a polyphenolic C-glucosylxanthone, is primarily found as a principal phytoconstituent in the leaves and stem bark of Mangifera indica (family Anacardiaceae) and has demonstrated potential neuroprotective activities. To date, limited literature exists for the estimation of Mangiferin in mice plasma using RP-HPLC. This study focuses on the development and validation of an RP-HPLC bioanalytical method for the estimation of Mangiferin in mice plasma samples. This method will be further utilized to investigate the pharmacokinetic profile of Mangiferin-loaded nanoparticles in animal models.

Aim: The aim of this study is to develop and validate a bioanalytical method for the quantification of Mangiferin using Reverse Phase High-Performance Liquid Chromatography (RP-HPLC).

Methodology: The Shimadzu HPLC system, equipped with a PDA detector and LC Solution 5.57 system control software, was employed to acquire, monitor, and process chromatographic data. A Phenomenex Kinetex® 5-micron C18 Column (250 x 4.6 mm) served as the stationary phase for drug separation. Isocratic elution was performed using a mobile phase consisting of 10 mM phosphate buffer at pH 2.4 with 0.1% triethylamine and acetonitrile in a 90:10 v/v ratio. The flow rate was set at 1.3 mL/min, and an injection volume of 50 µL was used, resulting in a total run time of 20 minutes. The developed method was validated following the ICH M10 guidelines.

Results: Mangiferin and the internal standard (Caffeine) were eluted at 14.783 minutes and 7.7 minutes, respectively, at 258 nm, which aligns well with reported run times. The linear calibration plot within the range of 50-1000 ng/mL demonstrated excellent linearity with an R2 value of 0.998. Accuracy and precision data fell within acceptable limits, and the recovery from plasma samples (250 ng/mL, 500 ng/mL, and 750 ng/mL) was found to be 103.8%, 99.7%, and 96.5%, respectively. The Limit of Detection (LOD) and Limit of Quantification (LOQ) were determined to be 0.66 ng/mL and 2 ng/mL, respectively. The peak % Relative Standard Deviation (% RSD) for robustness testing met the acceptance criteria.

Conclusion: The developed method exhibits strong linearity, accuracy, and precision. It can effectively determine the concentration of Mangiferin in mice plasma, facilitating the evaluation of the drug release pattern and pharmacokinetic profile in biological systems.

Keywords: RP-HPLC; Mangiferin; mangiferin indica; Bioanalysis; Pharmacokinetics studies

3. A systematic review and meta-analysis on the role of Glucosamine sulfate (GS), Chondroitin sulfate (CS), and their combination regimen in the management of Knee Osteoarthritis

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Abstract

Background: The prevalence of osteoarthritis, specifically in large weight bearing joints like knee and hips, is predicted to grow worldwide and accounts for almost four-fifths of the burden of osteoarthritis. There are several clinical trials available on the beneficial role of GS, CS and their combination in the management of knee osteoarthritis.

Aim: This study was aimed to assess the efficacy and safety of oral Symptomatic Slow Acting Drugs for Osteoarthritis (SYSADOAs) such as Glucosamine Sulfate, Chondroitin Sulfate, and their combination regimen in the management of knee osteoarthritis (KOA).

Methods: This systematic review was conducted according to PRISMA 2020 guidelines. A detailed literature search was performed from 03/1994 to 31/12/2022 using various electronic databases including PubMed, Embase, Cochrane Library, and Google Scholar using the search terms- Glucosamine sulfate, Chondroitin sulfate, Knee osteoarthritis, Joint pain, Joint disease, and Joint structure for literature concerning glucosamine, chondroitin, and their combination in the treatment of knee osteoarthritis. Cochrane Collaboration's Risk assessment tool (version 5.4.1) was used for assessing the risk of bias and the quality of the literature. The data was extracted from the included studies and subjected to statistical analysis to determine the beneficial effect of Glucosamine Sulfate, Chondroitin Sulfate, and their combination.

Results: Twenty-five randomized controlled trials (RCTs) were included [9 RCTs are exclusively for Glucosamine sulfate, 13 RCTs are exclusively for Chondroitin sulfate, and only 3 RCTs can be considered for assessing the possible benefits of the combination of Glucosamine sulfate (GS) and Chondroitin sulfate (CS) versus Placebo]. The results of this meta-analysis revealed the following: (1) Pain intensity: Chondroitin sulfate showed a significant reduction in pain intensity, (2) Physical function: Chondroitin sulfate showed a significant improvement in physical function; (3) Joint space narrowing: Glucosamine sulfate showed a significant reduction in tibiofemoral joint space narrowing. Their combination did not reduce pain intensity and showed no improvement in the physical function, whereas it showed a non-significant reduction in joint space narrowing. In the safety aspect, both compounds have a good safety profile and are well tolerated.

Conclusion: When the overall effect of these SYSADOAs was evaluated, it was seen that they reduced pain intensity and improved physical function showing their symptom-modifying action and decreased the joint space narrowing significantly showing their disease-modifying action. In the safety aspect, both compounds have a good safety profile and are well tolerated. This meta-analysis revealed that as individual drugs glucosamine sulfate showed a significant reduction in the joint space narrowing while chondroitin sulfate showed a significant reduction in pain intensity and improvement in the physical function. This meta-analysis also showed that the combination did not significantly improve the symptoms or modify the disease. This may be because of the availability of limited trials on the combination of the sulfate forms of the intervention. Thus,

further trials on the effect of glucosamine sulfate and chondroitin sulfate are required to establish accurate evidence regarding their use in KOA.
Keywords: Glucosamine sulfate, Chondroitin sulfate, Knee osteoarthritis, Joint structure

4. Primary Studies on Behavioural Test and Transcriptional Profiling for the Treatment of Alzheimer's Disease Using Beta Sheet Breaker Peptide-HPYD

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Background: Cognitive loss is a hallmark of Alzheimer's disease (AD), a progressive neurodegenerative illness. The majority of studies concur that the primary pathological feature of this condition is the aggregation and buildup of -amyloid peptides (A) in brain cells.
Methods: In accordance with the structure and amino acid sequence of the peptide H102, the peptide HPYD (His-Lys-Gln-Leu-Pro-Phe-Tyr-Glu-Glu-Asp) of 10 amino acids was developed based on the amyloid hypothesis. The accelerated stability test, thioflavin T (ThT) fluorescence spectral analysis, and transmission electron microscopy (TEM) imaging were used to assess the stability and inhibitory effects on the aggregation of A1-42 by H102 and HPYD. After being administered nasally to mice, the ability of FITC-labelled HPYD to go from the nose to the brain was first studied. Then, HPYD used the Morris Water Maze (MWM) test for behavioural studies to look at the learning and memory abilities of the APP/PS1 transgenic mice. The effects of HPYD on A beta and APP protein levels were studied using immunohistochemistry and Western blot analysis. Then again microarray analysis was used to evaluate the effect of HPYD on gene expression in AD mouse model.
Results: When compared to H102, HPYD exhibited improved stability and an inhibitory effect on the aggregation of A1-42, according to our in vitro findings. By lowering A and APP protein levels, HPYD could be nasally administered into the brain and enhanced learning and memory function in APP/PS1 transgenic animal models. Additionally, Liu et al. Treatment of AD by HPYD AD and gluco-lipid metabolism were dysregulated and could be restored to virtually normal levels after HPYD administration to mice. Microarray analysis revealed that several genes associated to the inflammatory pathway.
Conclusions: Based on our findings, HPYD may be a promising therapeutic medication candidate for the management of AD.
Keywords: Alzheimer’s disease, HPYD, β-amyloid peptides, APP, β-sheet breaker peptide

5. Development and Validation of Stability-indicating RP-HPLC Method for Simultaneous Estimation of Glycyrrhizic acid and Berberine in a Classical Ayurvedic Formulation

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Background: Ayurvedic medicines show immense potential because of their comprehensive approach to the management of disease. However, appropriate standardization tests are required before they can be integrated into conventional medicine. As the authenticity of the components used in the polyherbal formulations determines the safety as well as the effectiveness, chromatographic methods play a crucial role in the quality control of multifaceted Ayurvedic medicines. Pushyanuga churna is a polyherbal formulation made up of 25 different plant herbs and one mineral. Glycyrrhiza glabra and Berberis aristata are the major ingredients present in the Pushyanuga churna formulation. Glycyrrhizic acid and berberine are important phytochemical compounds present in the plant's Glycyrrhiza glabra and Berberis aristata. Pushyanuga churna has been used to treat menstrual disorders such as menorrhagia, leucorrhoea, amenorrhoea, and dysmenorrhoea. Additionally, it is used in the management of diarrhea, candidiasis, and vaginal yeast infection.
Aim: The objective of this study is to develop and validate a stability-indicating RP-HPLC method for the quantification of glycyrrhizic acid and berberine in Pushyanuga churna. Furthermore, the developed method will be employed for the analysis of these compounds in the formulation.
Method: Separation was accomplished using a Phenomenex C_{18} column with a solvent system comprising acetonitrile and pH 3.8 ammonium acetate buffer (40:60 v/v ratio) delivered by a flow rate of 1 mL/min. A photodiode array detector is used for the detection of wavelength at 249 and 265nm. As per ICH Q2 R1 guidelines in terms of system suitability, linearity, accuracy, precision, LOD, and LOQ the developed method was validated. The suggested approach was applied to the Pushyanuga churna formulation for the determination of glycyrrhizic acid and berberine. The phytochemical compounds are subjected to various stress conditions, including photolytic, oxidative, thermal, acid, and base hydrolysis, in order to establish a stability-indicating method.
Result: Glycyrrhizic acid and berberine got separated, showing a sharp peak at a retention time of 3.8 and 5.2 mins under optimized chromatographic conditions. The linearity of glycyrrhizic acid and berberine was in the range of 200–3000 ng/mL and 50–2000 ng/mL, respectively. The LOD and LOQ levels were 4.31 and 13.06 ng/mL for glycyrrhizic acid and 2.32 and 7.05 ng/mL for berberine, respectively. The % recovery of glycyrrhizic acid and berberine in the Pushyanuga churna formulation was found to be 90.55% and 92.38%, respectively. The stress testing results show that no co-eluting or degradant peaks exist at any of the stress levels tested.
Conclusion: The developed RP-HPLC method is a reliable technique for detecting, separating, and quantifying phytochemical compounds, and it has been validated in accordance with ICH guidelines. Therefore, the developed method is suitable for marker-based standardization and quality control of Pushyanuga churna.

Keywords: Glycyrrhizic acid, Berberine, Pushyanuga churna, Stability-indicating, RP-HPLC method.

6. DEVELOPMENT AND EVALUATION OF EMULGEL CONTAINING HERBAL DRUG FOR DERMATOLOGICAL APPLICATION

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Background: Curcumin hydrophobic in nature and developing it into a dermatological product offers challenges as it requires judicious selection of excipients.
Aim: This study was aimed to develop cinnamon oil based emulgel of curcumin for topical application thereby localizing the therapy.
Methods: The solubility of curcumin was studied in various surfactants and co-surfactants by varying the surfactant to co-surfactant (Smix) ratio. Microemulsions with different compositions were formulated and evaluated. The prepared o/w microemulsions containing curcumin were evaluated for pH, dye test, centrifugation, drug content, particle size and *in-vitro* drug release. Optimized microemulsion was incorporated to 1 % Carbopol® 934 and HPMC K4 M and was evaluated for, pH, spreadability*, in-vitro* permeation and stability.
Result: Cinnamon oil, span 20 and polyethylene glycol 8000 exhibited the highest solubility. Maximum microemulsion region was observed when the Smix ratio was 1:1. The average particle size of the prepared microemulsion was found to be in the range of 198.2 to 243.9 nm and zeta potential was -21.2 to +30 mV and permeability of the drug from the microemulsion was 24.74 % after 8 h. The prepared emulgel showed 32.53 % drug release after 8 h. Stability studies indicated that the formulation remained unaffected at storage conditions.
Conclusion: Results indicated that the emulgel has potential for sustained action of drug release and may act as a promising tool to enhance topical delivery of curcumin.
Key words: Curcumin, Antifungal, Microemulsion, Topical emulgel.

7. DEVELOPMENT AND EVALUATION OF LOZENGES CONTAINING FLUCONAZOLE FOR TREATING ORAL INFECTIONS

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Background: Conventional dosage forms and capsules are inconvenient, as they are difficult to swallowed and its ugly flavour of the dosage forms. Difficulty is experienced in particular by paediatrics and geriatric patients, but it also applies to people who are bedridden and to those active working patients who are busy or travelling, especially those who have no access to water.
Aim: This study was aimed to overcome from these difficulties lozenges are used. The objective of the study was to prepare and evaluate the lozenges by using antifungal drug fluconazole.
Methods: The prepared lozenges were evaluated for parameters like thickness, hardness, weight variation, disintegration time, drug content and *in-vitro* drug release. Formulation (F1) containing 10 mg drug with sucrose 1500 mg as base of the formulation, lactose 650 mg as diluent, citric acid 50 mg as flavouring agent and glycerine 0.2 ml as lubricant.
Result: The compatibility of the drug and excipients were investigated by using FTIR the result found that there was no interaction between the drug and the excipients. The heating-congealing, punching and melting-moulding method was used to prepare the lozenges. F1 showed 98.06±3.83 % released of drug and almost all drug was released in 24 mins of dissolution study. Stability studies indicated that the formulation remained unaffected at storage conditions.
Conclusion: Results indicated that the fluconazole lozenges prepared by heating-congealing method is a most suitable method preparing lozenges.
Key words: Lozenges, Fluconazole, Candidiasis.

8. DEVELOPMENT AND CHARACTERIZATION OF EMULGEL CONTAINING CLOTRIMAZOLE FOR TOPICAL APPLICATION

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Background: Clotrimazole is a BCS II, an imidazole, anti-fungal drug is selected as model drug, used primarily in the treatment of skin, oral and vaginal infections.
Aim: This study was aimed to develop clove oil based emulgel of clotrimazole for topical application thereby localizing the therapy.
Methods: The solubility of clotrimazole was studied in various surfactants and co-surfactants by varying the surfactant to co-surfactant (Smix) ratio. Microemulsions with different compositions were formulated and evaluated. The prepared o/w microemulsions containing clotrimazole were evaluated for pH, dye test, centrifugation, drug content, particle size and *in-vitro* drug release. Optimized microemulsion was incorporated to 3 % Carbopol® 934 and HPMC K4 M and was evaluated for, pH, spreadability, *in-vitro* permeation and stability.
Result: Clove oil, span 80 and PEG 4000 exhibited the highest solubility. Maximum microemulsion region was observed when the Smix ratio was 1:3. The average particle size of the prepared microemulsion was found to be 440.00 nm and zeta potential was -20.00 mV and diffusion of the drug from the microemulsion was 9.46 % after 6 h. The prepared emulgel showed 36.57 % drug release after 6 h. Stability studies indicated that the formulation remained unaffected at storage conditions.
Conclusion: Results indicated that the emulgel has potential for sustained action of drug release and may act as a promising tool to topical delivery of clotrimazole.
Key words: Clotrimazole, Antifungal, Microemulsion, Topical emulgel.

9. TRANSDERMAL DRUG DELIVERY SYSTEM OF AN ANTIDIABETES DRUG: DESIGN AND IN-VITRO EVALUATION

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Background: Linagliptin is an anti-diabetic drug that has been used to treat patients with diabetes mellitus. It belongs to class of dipeptidyl peptidase-4 inhibitors.
Aim: The objective of the study was to prepare sustained release transdermal patches of linagliptin by using different polymer i.e., HPMC K15M, HPMC K4M, chitosan, xanthan gum and sodium alginate in different concentration.
Methods: The solvent casting method was used to prepare the transdermal patches. The prepared transdermal patches were evaluated for various parameters like thickness, folding endurance, weight variation, moisture content, drug content and *in-vitro* drug diffusion.
Result: The drug to polymer interaction was investigated by FTIR study which ruled out any interaction between the drug and polymer. Formulation F4 containing linagliptin (2 mg), HPMC K4M (2 % w/v) and glycerine (0.125 %) showed sustained release with release of 47.97±1.93 % drug after 8h of diffusion study. The drug release from the prepared formulations followed Higuchi's model of diffusion mechanism.
Conclusion: Result indicated that, the transdermal patch of F4 formulation has potential for sustained action of drug release.
Key words: Transdermal drug delivery system, Linagliptin, HPMC K4M, HPMC K15M, chitosan, xanthan gum, sodium alginate.

10. FORMULATION AND EVALUATION OF KETOCONAZOLE NANO DISPERSION OF ALOE VERA BASED TOPICAL GEL

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Background: Ketoconazole is an imidazole antifungal drug belongs to class II drug of BCS. The nano dispersion as topical delivery system to increase ketoconazole localization in skin at the site of infection with reduced systemic exposure.
Aim: This study was aimed to develop a nano dispersion loaded aloe vera based gel for topical application.
Methods: The Ketoconazole nano dispersion was prepared by emulsion solvent evaporation method using poloxamer 188 as a stabilizer with dichloromethane as a solvent. Effects of various parameters like sonication power, duration of sonication, and concentration of stabilizer were studied. The nano dispersion were characterized particle size, zeta potential, PDI and dissolution. Optimized batch of nano formulation (F3) was incorporated in aloe vera based topical gel containing guar gum, carbopol 934 and HPMC K4M was evaluated for various physicochemical properties, drug content, *in-vitro* drug release and stability studies carried out in all formulation.
Result: The optimized formulation was found to be particle size 457.2 nm, zeta potential was -15.4 mV, PDI was 0.948 and dissolution was 88.48±0.65 % after 1 hour. Optimized batch of nano formulation (F3) was incorporated in aloe vera based topical gel various physicochemical properties to check the suitability for topical application. The formulation KN3 showed drug content (83.71±0.63 %) and *in-vitro* drug release (40.45±0.72 %) after 8 h and followed zero order kinetics with super case II mechanism of drug release. The results of stability study showed that formulation KN3 was stable during study period.
Conclusion: From the result it can be concluded that, ketoconazole nano dispersion loaded aloe vera based topical gel has potential for sustained action of drug release and may act as promising tool to enhance topical delivery of ketoconazole.
Key words: Ketoconazole, nano dispersion, poloxamer 188, particle size, topical gel, *in-vitro* release.

11. FORMULATION AND EVALUATION OF BUCCOADHESIVE TABLET OF LOVASTATIN USING NATURAL POLYMER

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Background: Lovastatin is an HMG-CoA reductase inhibitor used to lower the risk of cardiovascular disease and associated conditions. Lovastatin is having poor oral bioavailability (5%) so as to enhance the bioavailability the buccal route of drug administration is selected.
Aim: to formulate buccal tablet by direct compression method by using natural polymer(Atrocarpus heterophyllus).
Methods: The solubility of Lovastatin was studied in various organic solvents. Tablet with different compositions of polymers and natural polymer were formulated and evaluated. The tablets were prepared by direct compression method. The prepared buccal tablet containing drug were evaluated for weight variation, Friability, Swelling index, drug content and *In-Vitro* drug release. The stability test has been conducted to six formulations and then evaluated for Color change, Thickness, Change in shape.
Result: Methanol and phosphate buffer pH(6.8) exhibited a highest solubility of Drug. The weight variation of formulation found to be in range of 240.10±0.356 to 240.89±0.568.the hardness of formulation found to be in range of 7.2±0.23 to 8.6±0.79 kg/cm2. The formulation F7 containing jackfruit mucilage (19.3%w/w), and Carbopol 934P (26.6%w/w) showed maximum sustain release of 27±0.23% at the end of 7h dissolution study. The formulation F9 containing Carbopol (45.33% w/w) and HPMC K4M (16.66 %w/w) was swelled about 298%. Stability studies indicated that the formulation was table during study period.
Conclusion: Results indicated that, the formulation F7 was considered as best compared to all other formulation. The prepared tablet was suitable to administered as a buccal drug delivery.
Key words: Buccal tablet, Lovastatin, HMG-CoA reductase, Atrocarpus heterophyllus.

12. FORMULATION AND EVALUATION OF FLOATING RAFT FORMING SUSPENSION OF A MODEL DRUG FOR SUSTAINING DRUG RELEASE

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Background: Ciprofloxacin is a broad-spectrum antibiotic drug which belongs to fluoroquinolones. It is used to treat the patients with bacterial infections like urinary tract infections (UTIs), skin, bone, chest (pneumonia) and in stomach. The absorption window of ciprofloxacin is in the stomach.
Aim: The main objective of the study was to prepare and evaluate floating raft forming drug delivery system of ciprofloxacin by suspending method by using different polymers i.e., sodium alginate, pectin and aloevera gel powder. The formulations were prepared by using different concentration of polymers.
Methods: The suspension method is used for the preparation of floating raft forming drug delivery system. The prepared formulations were tested for various parameters like viscosity, pH, in-vitro gelling, in-vitro buoyancy, in-vitro dissolution and stability was carried out.
Result: The compatibility of drug and the polymers was investigated by FTIR it was found that no interactions have taken place between them. The drug content was within the range of 98.57 ± 1.66 to 99.28 ± 0.79. The *in-vitro* drug release was performed and the release was found between 56.07 ± 0.22 to 93.32 ± 0.30. The formulation F5 containing ciprofloxacin 1 % w/v, sodium alginate 2 % w/v and aloevera gel powder at 0.5 % w/v showed 93.32 ± 0.30 % of drug release at 9 h. The *in-vitro* release followed first order kinetics and non-fickian anomalous diffusion mechanism. The stability study indicated that, the formulations were stable during study period.
Conclusion: Results indicated that, the ciprofloxacin floating raft forming formulation prepared with sodium alginate and aloevera gel powder has good potential for sustaining drug release.
Key words: Floating raft formulation, Ciprofloxacin, Sodium alginate, Aloevera gel powder, Pectin.

13. FORMULATION AND IN-VITRO EVALUATION OF FAST DISSOLVING TABLET OF CINNARIZINE USING DEHYDRATED BANANA POWDER

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Background: Cinnarizine is anti-histamine drug, it exhibits poor water solubility and is used for vertigo, nausea, vomiting and motion sickness.
Aim: The aim of the present study was to utilize the dehydrated banana powder as a superdisintegrant in the preparation of FDT of Cinnarizine. By combining with various common binders, the effects on FDTs of Cinnarizine was studied by in-vitro evaluation.
Methods: FDTs was prepared by direct compression method using excipients microcrystalline cellulose, carbomer, carboxymethylcellulose, methylcellulose and povidone K-30 as binder; magnesium stearate and talc as lubricant and mannitol as diluent.
Result: Phytochemical studies on dehydrated banana powder indicated the presence of starch, gelatin and amino acids. The prepared cinnarizine FDTs was within the I.P specified limits for post-compression parameters. Formulation EF2 which used microcrystalline cellulose as binder showed the wetting time of 49.66 sec, *in-vitro* disintegration time of 45.67 sec and 105.70% drug release after 18 min. Drug-polymers compatibility, studied by FT-IR spectroscopy on optimized formulation showed that there are no major interactions. Furthermore, the EF2 formulation was subjected to stability studies and formulation found to be stable.
Conclusion: It can be concluded that, dehydrated banana powder is a promising super disintegrant agent for the FDT of cinnarizine, for faster disintegration and rapid dissolution which leads to rapid absorption of the drug through the oral mucosa.
Key words: Cinnarizine, dehydrated banana powder, fast dissolving tablet (FDT), superdisintegrant, disintegration time.

14. FORMULATION AND EVALUATION OF ORAL JELLIES OF CINNARIZINE IN COMBINATION WITH NATURAL PRODUCT

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Background: Cinnarizine is histamine H1- receptor blocker voltage gated calcium channel blocker. It is mainstay therapy for vestibular disorders, approved for nausea, vomiting, motion sickness, vertigo and tinnitus associated with Meniere's diseases.
Aim: The aim of the study was to prepare immediate release oral jellies of Cinnarizine in combination with natural product and evaluate them.
Methods: The heat and congealing method was used to prepare the oral jellies. For preparation of oral jellies the polymers like xanthan gum, sodium alginate, and gelatin were used. The jellies with different concentration and ratios were prepared. The prepared oral jellies were evaluated for various parameters like drug compatibility by FT-IR, pH, weight variation, spreadability, viscosity, drug content, in-vitro drug release, and stability study.
Result: Physical parameters of all the formulations were within the acceptable limit. The drug content of the prepared formulations was found to be between 95.66±2.4- 97.86±1.2 % and *in-vitro* drug release study was found to be above 89%. The formulation F5 showed the 97% of drug release within 15 minutes and all the physical properties were within the acceptable limit. Hence it was selected as best formulation. As per stability studies the formulation F5 was found to be stable within the study period. No significant changes were observed in the FT-IR spectra of physical mixture when compared to the pure drug.
Conclusion: From the above results it can be concluded that the oral jelly of cinnarizine can be a promising approach for paediatrics use.
Key words: Cinnarizine, Sodium alginate, gelatin and xanthan gum.

15. DEVELOPMENT AND VALIDATION OF RP-HPLC METHOD FOR THE SIMULTANEOUS ESTIMATION OF ITRACONAZOLE AND SECNIDAZOLE IN BULK AND FORMULATIONS

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Background: Literature survey revealed that no analytical method has been developed for the simultaneous estimation of mentioned combination, hence an attempt has been made to develop and validate RP-HPLC method for the stated combination.
Aim: This study was aimed to develop and validate RP-HPLC method for the simultaneous estimation of Itraconazole and Secnidazole.
Methods: The chromatographic analysis was performed on Shimadzu model equipped with SPD-20 AD UV detector and the separation was performed using Enable C18 column. The analytes were monitored at 257 nm using methanol**:** potassium dihydrogen phosphate buffer (PDP) pH 5.5 in the ratio of 90: 10 v/v with a flow rate of 1.5 ml/min. The developed method was validated for its linearity, accuracy, precision, robustness, LOD and LOQ as per ICH guidelines.
Result: The retention time was found to be 6.037 min for ITZ and 3.788 min for SEC. The linearity was found to be in the range of 10-50 µg/ml for both ITZ and SEC with a regression coefficient of 0.999 and 0.998 for ITZ and SEC respectively. The recovery studies and %RSD values were discovered to be less than 2%, confirming its accuracy and precision. LOD and LOQ values were found satisfactory.
Conclusion: Results indicated that the developed method was accurate, precise and robust. Therefore, this approach may be used for the routine quality control of ITZ and SEC in bulk and formulations.
Key words: Itraconazole, Secnidazole, RP-HPLC, Validation.

16. A SUNSCREEN BASED ON AVOBENZONE LOADED IN SOLID LIPID NANOPARTICLES FOR ENHANCED SUN PROTECTION

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ABSTRACT

BACKGROUND: Incorporating chemical avobenzone (Chemical UV absorber) into SLN(Physical UV reflector) prevents chemical degradation and increases the UV-blocking capacity. The incorporation of sunscreen into SLN leads to a synergistic photoprotection.

AIM: The aim is to formulate and characterize a stable, effective, safe and SLN loaded Sunscreen.

METHOD:

Preparation of SLN:

1. Microemulsion method: A drug is dissolved in molten lipids at a temperature above the lipid's melting point. Then an aqueous phase containing water and surfactant (pre-heated to the same temperature) is added under mild stirring to form a transparent and thermodynamically stable microemulsion .The microemulsion is then poured into a cold aqueous phase 25 to 50 times greater than the hot emulsion .Upon dilution ,a nanoemulsion is formed, and lipids immediately crystallize to form solid lipid nanoparticles. This method was successfully applied to prepare drug-loaded solid lipid nanoparticles.

Preparation of Sunscreen loaded with SLN :

The required quantity of cetyl alcohol and cocoa butter were taken in a beaker and heated in a water bath upto 70 degree Celsius to obtain a molter mask and add SLN to (Phase A or oil phase). In another beaker, take triethanolamine,water, and sodium benzoate and heat upto 75 degree Celsius (Phase B or Aqueous phase). Mix both solutions by adding are phase into another phase with continuous stirring until a cream-like consistency. After obtaining cream consistency, add the required quantity of Lemon grass oil.

CONCLUSION;

These chemical absorbers incorporated sunscreen loaded with SLN might provide costeffective,safe,photostable sunscreen

KEYWORDS:

SLN Loaded sunscreen, SLN(Physical UV reflector), Avobenzone (Chemical UV absorber), Synergistic photoprotection.

17.“Method Development and Validation of Stability Indicating UV-Spectrophotometric Method for Loxoprofen Sodium”

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Method Development and Validation of Stability Indicating UV – Spectrophotometric Method for Loxoprofen Sodium

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Background:
In the present study UV-Spectrophotometric method of Loxoprofen sodium was developed and validated. A further developed method was used to study stress degradation behavior of Loxoprofen Sodium.
Aims:
To develop and validate UV-Spectrophotometric method for Loxoprofen Sodium.
Method:
The UV-Spectrophotometric method development was begun with the solvent selection and λ-max determination. The solubility of Loxoprofen sodium was checked in various solvents. A literature survey revealed that Loxoprofen sodium is soluble in water as well as in methanol. In most of the studies, methanol is used as a solvent for UV spectroscopy. In our research work, we have used distilled water for estimation. Analysis was carried out at 223 nm. Validation of the developed method was carried out in terms of various parameters as per the current regulatory requirements. Stress degradation of drug was studied at Acidic, Basic, and Oxidative conditions.
Results:
Linearity was observed in the range of 5-25µg/ml with correlation coefficient of 0.999. The developed method was found to be Specific, Precise, Robust, Rugged with LOD and LOQ value of 0.012 and 0.037µg/ml respectively. During stress degradation study, it was observed that drug is susceptible to basic and oxidative conditions with degradation of more than 10%.
Conclusion:
The simple and accurate UV-spectroscopic method for analysis Loxoprofen sodium was developed and validated. The results obtained have highlighted the accuracy, specificity, linearity, precision, and ruggedness of the method. The behavior of Loxoprofen sodium under various stress conditions was studied and reported. The drug was found to be stable in basic conditions, while considerable degradation was observed in basic and oxidative degradation studies. The developed method can be used for quality monitoring of bulk samples in small scale industries.
Key words: Loxoprofen sodium, Stress degradation, Method validation,UV-Spectrophotometric.

18. Taste Masking of Aripiprazole Using Ion Exchange Resin: A Creative Method for Increasing Patient Compliance

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Abstract:
Aripiprazole is an Anti-psychotic drug that plays an important role in mental health disorders; however, their bitter taste often leads to poor patient compliance, especially in pediatric and geriatric populations. Taste masking techniques have gained prominence in pharmaceutical research to enhance the palatability of bitter drugs. This study explores the use of ion exchange resin as a promising taste masking agent for Aripiprazole.
The goal of this study is to create a novel taste-masking formulation for Aripiprazole utilizing ion exchange resin and to assess how well it can cover up the bitter taste. Aripiprazole was enclosed in ion exchange resin, a polymeric substance recognized for its capacity to exchange ions with nearby solutions, inhibiting their contact with taste receptors on the tongue.
The process comprised choosing the right ion exchange resin based on the compatibility of the resin with the medication, the loading capacity, and the characteristics of the drug release. The interaction between the resin and the drug molecules was studied using a number of analytical methods, such as scanning electron microscopy (SEM) and Fourier-transform infrared spectroscopy (FTIR). Studies on in vitro dissolution were carried out to evaluate the drug release profile and sensory analysis was done to measure the enhancement of taste perception.
The bitterness was significantly reduced, according to the results, which showed that the antipsychotic medication had been successfully encapsulated within the ion exchange resin matrix. Controlled medication release from the improved formulation ensured therapeutic efficacy while reducing the harsh taste. The higher palatability of the antipsychotic medicine covered with ion exchange resin was supported by sensory evaluation results from human volunteers, underscoring its potential to increase patient compliance and treatment outcomes in general.
This study offers a viable method for disguising the taste of antipsychotic medications using ion exchange resin, resolving a significant problem in pharmaceutical manufacturing. The created formulation is an important development in the field of medication delivery since it not only successfully hides the bitter taste but also allows for controlled drug release. This study lays the path for the creation of formulations that are accommodating to patients, ultimately boosting the standard of living for those who need antipsychotic therapy.

19. DISSOLUTION ENHANCEMENT OF ATAZANAVIR SULPHATE BY SOLID DISPERSION TECHNOLOGY

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Background: Solid dispersion is solid solution methods for improving the dissolution rate of sparingly soluble drugs. The solubility of poorly soluble drugs may be improved by solid dispersion technique. Stabilization of unstable drugs is possible in solid dispersions.
Aim: To improve the solubility of poorly soluble drug (Atazanavir Sulphate).
Objective: To make the drug (Atazanavir Sulphate) more soluble using carrier (Beta-cyclodextrin) with the different ratios (Drug: Carrier) (1:1), (1:2), (1:3), (1:4) and (1:5).
Method: The solid dispersion was prepared by Kneading solution method to improve the dissolution characteristics rate of sparingly soluble drugs. The evaluation parameters were carried for high drug release ratio of prepared solid dispersion are Differential Scanning Calorimetry, X-ray diffraction studies, SEM studies. The drug content of the solid dispersions was determined by UV method. The dissolution studies were carried out using USP (XXII) dissolution apparatus by Paddle method. Compatibility studies of Atazanavir Sulphate with selected carrier β-Cyclodextrin were done by FTIR spectral matching approach. The release of drug from the solid dispersions was 30.12 (1:1), 64.21 (1:2), 51.71 (1:3), 53.82 (1:4), where it was observed that a 95.42 (1:5). The solid dispersion with 1:5 reported have release of sustained release pattern.
Result: The solubility of poorly soluble drug (Atazanavir Sulphate) was increased from 15.32% to 95.43% (based on Dissolution Studies).
Conclusion: Based on Outcome of the Study, Increase in Solubility of Atazanavir Sulphate Was confirmed.
Keywords: Solid Dispersion, Atazanavir Sulphate, Kneading method, Solubility, Dissolution.

20. Preparation, characterization, and evaluation of PLGA nanobubbles for the delivery of palbociclib

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Abstract:

Background: Nanobubbles developing as important delivery systems for imaging and as carriers for drug delivery at targeted region. Nanobubbles are nanometer size bubbles having different constituents of varying physicochemical characteristic for the inner core and outer shell. Nanobubbles are mainly fabricated to improve the stability, bioavailability and improve the biodistribution of the delivered drug to the specific targeted site.

Aims and objectives:

PLGA-shelled and perfluropentane filled nanobubbles were developed for the delivery of anticancer drug palbociclib and to investigate the cellular uptake and in vitro anti-tumor efficacy of palbociclib loaded PLGA nanobubbles.

Methods and Results:

The formulation components were optimized with respect to particle size and size distribution using response surface methodology. Nanobubbles prepared under optimal conditions exhibited uniform particle size distribution. Compared with the solubility of palbociclib suspension, that of the palbociclib nanobubbles is significantly increased at different pH values. In vitro dissolution test demonstrated that compared with the suspension, palbociclib nanobubbles displays better dissolution profiles and higher gastrointestinal stability, leading to a significant increase in oral bioavailability. Moreover, in vitro cytotoxicity studies illustrated that palbociclib nanobubbles displayed superior growth inhibition of tumor cells.

Conclusion: PLGA nanobubbles can be considered as an interesting tool in the development of ultrasound-responsive formulations for targeting drug delivery.

Keywords: PLGA, BBD, RSM, EE

21. HYDROTROPHY-A PROMISING TECHNIQUE FOR ENHANCING SOLUBILITY OF POORLY SOLUBLE DRUGS

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Background: More than one-third of the drug listed in Indian Pharmacopeia and US Pharmacopeia fall into the poorly water-soluble or water-insoluble categories. 41% of the failures in new drug development have been found due to poor biopharmaceutical properties mainly including water insolubility. Mostly newly developed drug molecules are lipophilic in nature and have poor solubility which is one of the most difficult problems of these drugs. Various organic solvents such as methanol, chloroform, dimethylformamide and acetonitrile have been employed for solubilization of poorly water-soluble drugs to carry out analysis of poorly water-soluble drugs.Hydrotropy is a solubilization phenomenon whereby addition of large amount of second solute results in an increase in the aqueous solubility of another solute.
Aim: To improve the aqueous solubility, dissolution rate, and bioavailability of poorly water-soluble drugs.
Method: Solid dispersion PH adjustment Surfactant Hydrotrophy Salt formation
Result: The aqueous solubility, dissolution rate, and bioavailability of Poorly water-soluble drug was Improved.
Conclusion: By this Study we can conclude that, Solubility is the most important physical characteristic of a drug for its oral bioavailability, formulation, development of different dosage form of different drugs and for quantitative analysis. Solubility can be enhanced by many techniques among them hydrotropy is of very much importance.
Keywords: Dissolution, electrospinning, eutectic mixture, hydrophobic drugs, lyophilisation

22. Screening of soil isolates and optimization of the production parameters of Polyhydroxyalkanoates (PHA) using agricultural wastes.

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Abstract

Background:

Population explosion in recent years has driven the environment to over usage of non-degradable substances causing air, water, and land pollution. Over the past 70 years, plastics and related materials have been used widely in such proportions that they have become a part of our daily lives. Most of the polyhydroxyalkanoates are synthesized by Gram-positive and Gram-negative bacteria. PHAS is hypothesized to serve as a trap for carbon and lowering equivalents because they aggregate as distinct granules up to 90% of the dry weight of the cell.

Aim:

The study aimed to produce environment-friendly biodegradable Polyhydroxyalkanoate biopolymers of bacterial origin and optimize its production parameters.

Methods:

The main objective and importance of this study were to screen the bacterial isolates producing Polyhydroxyalkanoate from the soil samples and their characterization. To isolate bacteria an attempt was made by collecting soil samples at different places like the backyard of the college, Manipal endpoint, Hoode Beach, Tenkabettu garbage, and paddy fields. Out of the seventeen isolates, five promising bacterial strains exhibited comparatively higher polyhydroxyalkanoates production and were taken up for further studies. The highest polyhydroxyalkanoate-producing bacterial strain was identified. Optimization of process parameters was performed using the Plackett-Burman approach. The isolated bacterium was able to synthesize polyhydroxyalkanoate using starch as the sole carbon source. The identification and characterization of the biopolymer was performed using FTIR, NMR, DSC, LC-MS analysis.

Results: Soil isolates were screened for PHA and optimized the production parameters using agricultural waste.

Keywords: Soil isolates, Polyhydroxyalkanoates, Agricultural wastes

23. DEVELOPMENT AND VALIDATION OF NEW ANALYTICAL METHODS FOR SIMULTANEOUS ESTIMATION OF CILNIDIPINE AND METOPROLOL SUCCINATE IN BULK DRUG AND PHARMACEUTICAL FORMULATIONS.

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Background- Reported literature indicates that there are no reports available for the Method development and Validation of simultaneous estimation of Cilnidipine and Metoprolol Succinate in bulk drug and pharmaceutical formulations by RP-HPLC method. **Aim and Objectives:** To develop and validate a new RP-HPLC analytical method for the simultaneous estimation of Cilnidipine and Metoprolol Succinate in bulk drug and pharmaceutical formulations as per ICH guidelines. A simple, precise, accurate, robust and rugged method for RP-HPLC method was developed. **Methods:** RP-HPLC method was developed for above mentioned combinations by using C18 column with flow rate of 1ml/min and isocratic elution system was followed. The mobile phase used for the separation was Acetonitrile and 0.1M sodium dihydrogen phosphate buffer pH adjusted to 7 with ammonia in ratio of 70:30v/v and detected at 254nm. **Results:** The method was developed and validated, Cilnidipine and Metoprolol Succinate showed good linearity in concentration range of 8-40 µg/ml and 20-100 µg/ml with regression co-efficient value of 0.999 and 0.999. LOD and LOQ for Cilnidipine was found to be 0.33 µg/ml and 0.99 µg/ml and for and Metoprolol Succinate 0.1022 µg/ml and 0.3098 µg/ml respectively. **Conclusion:** The method was found to be precise, accurate, robust and rugged as per ICH guidelines and results were within their acceptable criteria.

Key Words: Cilnidipine, Metoprolol Succinate, RP-HPLC, Validation and Method development.

24. Brand Names and Use of Hedonic Symbols: Content Analysis of Cosmetics in Indian Market

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People in everyday life, in addition to utilitarian and practical consumption, choose hedonistic consumption, which provides a range of perceptions, emotions, and pleasure. The origins of hedonistic products are often described through the product's inherent qualities and individual traits. These two characteristics are frequently used to investigate the influencing factors of hedonistic consumption. Women in developing countries such as India, the words "fair" and "beautiful" are almost synonymous. Skin-whitening creams taking up nearly half of India's total skincare market. This study will explore the degree to which brands for skincare and haircare products use hedonic evidence while developing brand names. In this study the different skincare and haircare products of Indian, American, and European market were compared in terms of hedonic value. To analyze and compare the hedonic value of cosmetic products in Indian, American, and European market. Data Collection: The data collection was done for various skincare and haircare brands of Indian origin companies available online as well as in stores. In case of European and American origin cosmetics, the data was collected from the online e-commerce websites. Sources of data collected: Following are the sources where the information of Indian, American, and European origin brand details was collected. Sample Size: 97 Indian skincare, 43 Indian haircare products, 87 American skincare, 48 American haircare products, 39 European skincare, 15 European haircare products. According to results, English is the most widely used language for brand communication, accounting for exactly 53%, followed by French (20%), Sanskrit (16%), and Others (9%), which includes languages such as German, Italian, Greek, and Latin. Finally, at 2%, there is Hindi. Out of 97 skincare products, 68 skincare products were from Indian origin brands. Brands having English words was 35 products, French words was 16, Sanskrit words was 15, Hindi words was 2 and lastly one word was included into others. Out of 97 skincare products, 29 skincare products were from international origin brands. Brands having English words was 17 products, French words was 3, German words was 2, Greek words was 3 and lastly Latin words was 3. English (52%) is the language which is predominantly used by companies of both Indian and International origin, followed by French (24%). Sanskrit (16%) and Hindi (7%) words were seen in Indian origin. Lastly at 1% stands others which was Urdu. The comparative study between Indian, American and European brands reveals that Indian origin companies use words which is derived from Sanskrit and the brand communication portrays ayurvedic benefits of the product. Apart from Sanskrit, the language used by Indian companies is predominantly English, followed by French inspired words. The hedonic words which are noticed is “cruelty free”, “vegan” and “chemical free”. European cosmetic industry is renowned worldwide, specifically France is known for their skincare and haircare products. The uniqueness and distinctive features of the products creates hedonic experience for the consumers. The hedonic value is subjective and depends upon the geographic and demographic parameter. Certain words used for brand communication can create brand identity and optimistic image of the brand.

25. Safety and efficacy of oral Alpha lipoic acid in the management of Diabetic Neuropathy: A Systematic Review and Meta-analysis

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Abstract

Background: Diabetic neuropathy is a common and debilitating complication of diabetes, characterised by nerve damage leading to various sensory and motor problems. Alpha lipoic acid (ALA) has emerged as a potential treatment for managing diabetic neuropathy. This abstract summarizes a comprehensive evaluation of the efficacy and safety of oral ALA for diabetic neuropathy management through a meticulous review of randomized controlled trials.

Aim: This study was aimed to assess the efficacy and safety of oral Alpha lipoic acid for the management of diabetic neuropathy.

Methods: A detailed literature search was performed using the databases like Pubmed, Embase, and Google scholar. Search was mainly focused on Randomized controlled trials (RCTs) for evaluating safety and efficacy of Alpha lipoic acid in managing diabetic neuropathy. Based on inclusion and exclusion criterias Eight studies were selected. Data were extracted to examine the quality and characteristics of the studies. Primary outcomes were HbA1c, Neuropathy impairment score (NIS), Neuropathy impairment score-Lowe limb (NIS-LL), Motor nerve conduction velocity (MNCV), Neuropathy Symptoms and Change (NSC), Total severity score (TSS), Neurological Disability Score (NDS), Vibration Perception Thresholds (VPT). The secondary outcome was safety parameters.

Results: Eight randomized controlled trials met the inclusion criteria were selected and the efficacy and safety of Alpha lipoic acid in treating diabetic neuropathy were critically analysed in comparison to the placebo group. The results of this systematic review and meta-analysis **showed:** Alpha lipoic acid has reduced HbA1c levels, ALA administration significantly decreased the Neuropathy Impairment Score, ALA administration significantly decreased NIS-LL, ALA didn't show significant improvement in MNCV Score, ALA found to be beneficial in improving NSC score, ALA found to improve TSS, ALA shows significant improvement in NDS, ALA shows significant improvement in VPT when compared with control group.

Conclusion: From this meta-analysis, we concluded that use of Oral ALA provides significant improvement in HbA1c, NIS, NIS-LL, NSC, TSS, NDS, VPT parameters when either given at higher dose like 1800mg/day for atleast 1week or given at dose 600-1200mg/day for a longer period of time like 3weeks-4years in patients with diabetic neuropathy and from systematic review, we concluded that dose of 600mg/day upto 24months is considered a safe option as no adverse effect is seen in most of the population. At dose of 1200-1800mg/day, distinct adverse effects are seen when given for 5weeks or more.

Keywords: Diabetic neuropathy, DN, Alpha lipoic acid, ALA, Thioctic acid

26. Comparative Assessment of Quality of Life in Dialysis Patients: Utilizing KDQOL-36, EQ-5D-3L, and EQ-5D-5L Instruments for Mapping and Analysis

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Background:

The quality of life (QoL) of haemodialysis patients is significantly affected by kidney disease. To comprehensively evaluate the standard of living in the population, it is essential to employ reliable and validated assessment tools. The widely used KDQOL-36 survey is a valuable assessment tool for examining the QoL of people with renal illness. However, mapping KDQOL-36 scores to generic health-related QoL measures such as the EQ-5D-3L and EQ-5D-5L is crucial to facilitate comparisons and enhance the interpretability of results.

Aims: To analyse the comparative assessment of the quality of life in dialysis patients utilizing KDQOL-36, EQ-5D-3L, and EQ-5D-5L instruments for mapping and analysis.

Methods: It is a multi-centric prospective cross-sectional study conducted at tertiary care hospitals. Patients and family members were used as sources for data collection. The tools used for data collection are KDQOL-36, EQ-5D-3L and EQ-5D-5L. The KDQOL-36. Data were converted into EQ-5D-3L and EQ-5D-5L utility ratings using widely recognised mapping techniques. Statistical analysis was conducted to determine the mapping relationships and evaluate the instrument response.

Results: Responses were collected from a total of 385 patients undergoing treatment at tertiary care hospitals. The median and standard deviation values were obtained from group 1 and group 2. PCS (11.04 ± 2.12, 11.73 ± 2.23), MCS (15.44 ± 2.47, 15.84 ± 2.35), Symptoms/problems list (26.49 ± 4.83, 26.53 ±4.14), Burden of kidney disease (9.41±2.08, 9.34 ±2.00), Effects of kidney disease (15.07 ± 2.72, 15.06 ±2.85). EQ-5D-3L (France) shows the mean and standard deviation values in group 1 (0.721 ± 0.0842) and group 2 (0.761 ± 0.0826). EQ-5D-5L (Singapore) shows the mean and standard deviation values in group 1 (0.772 ± 0.1787) and group 2 (0.851 ± 0.1372). The mapping process will provide a conversion framework that translates KDQOL-36 scores into utility values derived from the EQ-5D-3L and EQ-5D-5L.

Conclusion: Mapping the KDQOL-36 to the EQ-5D-3L and EQ-5D-5L instruments will enhance the utility of KDQOL-36 in assessing QoL in patients undergoing dialysis. The availability of mapped scores will promote the integration of kidney disease-specific QoL data with broader health-related QoL measures, contributing to a comprehensive evaluation of the impact of kidney disease on patients' overall well-being. Symptoms/problems list scale showing the higher values followed by MCS, EKD, PCS and BKD.

Keywords: Haemodialysis, Cost-effectiveness, KDQOL-36; EQ-5D-3L-5L

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