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DEVELOPMENT OF VESICULAR DRUG DELIVERY SYSTEM FOR TINOSPORA CORDIFOLIA

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Back ground: Tinospora cordifolia is a herb exhibiting anti-inflammatory, anti-psoriatic, anti-rheumatic activities. The NSAIDS upon prolonged usage exhibit severe adverse effects like gastro intestinal problems, peptic ulcers, and cardio vascular problems.Tinospora cordifolia ethosomal gel can be considered as a alternative formulation to relieve pain and inflammation. As this herb possess poor solubility and bioavailability the solubility and Bioavailability can be enhanced by adopting vesicular drug delivery systems such as ethosomes.

Hypothesis: The aim of the present study is to develop Ethosomal formulation of Tinospora cordifolia using cold method of preparation and to study its anti-inflammatory property on albino rats.

Methodology: The dried stem extract of Tinospora cordifolia was obtained using soxhlet apparatus.In phytochemical screening tests, the presence of Tannins,Flavanoids, Saponins, Ammino acids and proteins was observed.TLC revealed the methonalic stem extract of Tinospora cordifolia contains Tannins. Mobile phase taken as n-hexane, Ethylacetate and Glacialacetic acid in different ratios such as 5:4:1,6:3:1,and7:2:1.Rf values were calculated for different bands and the values were found to be 0.76 for the standard tannic acid and 0.73 for the stem extract of Tinospora cordifolia indicate the presence of Tannins,0.84 conform the presence flavaniods and 0.56 reveals the presence of phenols respectively.Six formulations were prepared by taking different concentrations extract by cold methods.,i.e.,E1,E2,E3,E4,E5,E6.

Result: The maximum Entrapment efficiency of E1formulation as determined by ultracentrifugation was 96%.Methanolic extract of ethosomal formulation of Tinospora cordifolia has shown drug release of 96.84%, Zeta potential of -32.7mV. Hence E1formulation was considered to be the best formulation among all the formulations. The best formulation was further developed into ethosomal gel. The pH value for ethosomal gel of Tinospora cordifolia was found to be 6.4.Ethosomal gel was showing better In vitro diffusion of 45.2% and the drug content of 95.3%. Anti-inflammatory activity was tested for the ethosomal gel of Tinospora cordifolia and was compared with the diclofenac gel. Anti- inflammatory activity after 3hrs was found to be 45.80% for the ethosomal gel.

Conclusion: Ethosomal formulation was prepared for Tinospora cordifolia. The best formulation was converted to gel. Anti-inflammatory activity was studied for the prepared herbal gel and compared with diclofenac gel. The herbal ethosomal gel was showing promising anti-inflammatory activity.

Key words: Mean vesicle diameter, Entrapment efficiency, Drug content, Drug diffusion studies, ethosomal gel, Tinospora cordifolia

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SIEROLOGICAL IMPROVEMENT ON VACCINE ASSESSMENT TO A BETTER EFFICACY ON SARS-COV2 VARINATS.

Antonio Steardo

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Since Edward Jenner discovered in 1796, the first vaccine against smallpox, this therapeutic tool made the difference to fight epidemics. Even in this last case, vaccination on population decreased mortality and morbidity during SarS-CoV2 pandemic. The vaccine creates immunotrophycal barriers. It is thanks to the deployment of the pathogen in different phases of entry and replication on pulmonary and mucosal tissues. The last scientific evidence on the Covid-19 vaccine aims to assess efficacy by clinical trial phase 3 on immune correlates analysis of the vaccine mRNA-1237. Administering two doses, the second dose after four weeks, the vaccine efficacy has been tested on vaccine recipients with 50% neutralization titers 10,100,100. It has esteemed vaccines efficacies of 78% (95% confidence interval, 54 to 89%), 91% (87 to 94%), and 96% (94% to 98%) respectively. These results confirm the efficacy of a mRNA-1273 vaccine rather than other vaccines. Further steps should have been done to assess efficacy on variants by VN-Ab antigen as laboratory measurement. It can predict outcomes on large scale studies for SarS-CoV2 vaccine efficacy. This test can predict SarS-CoV2 infection resistance for variants, e.g., on the Omicron variant. By focusing on early serological laboratory, measurements can assess non-protective levels in some vaccines for five up to six months, assessing the efficacy on extended memory immune response. This test is a different way to assess vaccines rather than evaluate morbidity and mortality in large scale trial assessment. It would make it possible to assess the efficacy like the Omicron variant case.

Biography

Dr. Rabbany completed her Bachelors in Psychology at the University of California, Berkeley at the age of 20. She received her medical training at the Sackler School of Medicine. She is currently a Psychiatry Resident Physician at Arrowhead Regional Medical Center and a Research Investigator at Cornell School of Medicine as well as at Columbia University. She is amongst the 2021 awardees of the SCPS/ PER Excellence in Psychiatric Education Award.

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ANGIOPOIETIN-2-INDUCED LYMPHATIC ENDOTHELIAL CELL MIGRATIO DRIVES LYMPHANGIOGENESIS VIA THE B1 INTEGRIN-RHOA-FORMIN AXIS

Constantinos M.Mikelis

University of Patras, Greece

Lymphangiogenesis is an essential physiological process but also a determining factor in vascularrelated pathological conditions. Angiopoietin 2 (Ang2) plays an important role in lymphatic vascular development and function and its upregulation has been reported in several vascularrelated diseases, including cancer. Given the established role of the small GTPase RhoA on cytoskeleton-dependent endothelial functions, we investigated the relationship between RhoA and Ang2-induced cellular activities. This study shows that Ang2-driven human dermal lymphatic endothelial cell (HDLEC) migration depends on RhoA. We demonstrate that Ang2-induced migration is independent of the Tie receptors, but dependent on β1 integrin-mediated RhoA activation with knockdown, pharmacological approaches, and protein sequencing experiments. Although the key proteins downstream of RhoA, Rho kinase (ROCK) and myosin light chain (MLC), were activated, blockade of ROCK did not abrogate the Ang2-driven migratory effect. However, formins, an alternative target of RhoA, were identified as key players, and especially FHOD1. The Ang2-RhoA relationship was explored in vivo, where lymphatic endothelial RhoA deficiency blocked Ang2-induced lymphangiogenesis, highlighting RhoA as an important target for anti-lymphangiogenic treatments.

Biography

Dr. Mikelis has completed his PhD from University of Patras in Greece and postdoctoral studies at the National Institutes of Health. He set up his research program in Texas Tech University Health Sciences Center (TTUHSC), where reached the Associate Professor level at the School of Pharmacy of TTUHSC and recently moved to the Department of Pharmacy at the University of Patras as an Associate Professor. He has published more than 60 papers in reputed journals and has been serving as reviewer and editorial board member of many scientific journals.

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ANTIBACTERIAL ACTIVITY OF THE PHYTOCOMPOUNDS AGAINST THE PREDOMINANT BACTERIAL SPECIES IN PAKISTANI SPECIMENS

Muhammad Hamza Tariq

National Taiwan University, Taiwan

Background: Bacterial pathogens are reported to cause wide range of life-threatening infections, and most of the infectious bacteria have evolved to resist all classes of antibiotics. To tackle the issue of antibiotic resistance, phyto-compounds are being studied for their therapeutic properties against the bacteria. Objectives: This study was conducted to evaluate the prevalence of common bacteria in different body samples of Pakistani natives and to find the antibiotics resistance in the most prevalent identified species. Another important objective was to predict a phytochemical with a strong potential to act as future antibiotic against the predominant bacteria in various specimens. Methods: 972 specimens were collected from different sources of Pakistani patients. Bacteriological profiling of different specimens were performed using morphological and biochemical characterization. One of the survival proteins of the predominant Bacteria was taken for Molecular Docking analysis against the lead phyto-compounds from different plants using MOE software. Results: S. aureus was the most common bacterial species among various pathogens against which all of the commonly used antibiotics were found to be ineffective except Linezolid. The Emp binding protein, required for the survival of bacteria, was modeled and used for docking analysis. Sinapic acid, naringenin, daidzein, and calycosin, were the four phytoligands which exhibited maximum binding affinity with the target protein and also demonstrated the acceptable drug-like properties. Conclusion: From the study, it is suggested that Sinapic acid, naringenin, daidzein, and calycosin can be used as an antistaphylococcal agent to cope up the growing antibiotic resistance against this pathogenic bacteria.

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1,2,4,5-TETRAOXANE DERIVATIVES: NOVEL ANTIMALARIAL AGENTS

Mukesh Kumar Kumawat
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The growing resistance and the lack of an effective antimalarial vaccine emphasize the need to develop a novel, safe, affordable antimalarial drug effective against multi drug-resistant malaria. A number of useful aminoquinoline-based antimalarials were synthesized that included pamaquine, chloroquine, amodiaquine, pentaquine, primaquine, mefloquine etc and research is still continuing to make effective new antimalarial agents by their structural modification which may be active towards resistant malaria parasites. The discovery of artemisinin was the beginning of a significant effort to identify synthetically accessible antimalarial peroxides. Artemisinin, a 1,2,4-trioxane compound isolated from Chinese plant Artemisia annua, has been one of the most effective antimalarial against P. falciparum. However, limited availability, high cost, and poor bioavailability have been the major drawback of artemisinin. A disadvantage with the semisynthetic compounds is that their production requires artemisinin as starting material. Artesunate and artemether, semi-synthetic derivatives of artemisinin, also show poor pharmacokinetic properties. Therefore, there is much need for the development of new and improved approaches to synthetic endoperoxides. Tetraoxanes are believed to have a similar mode of activity as the naturally occurring peroxides such are artemisinin. 1,2,4,5-Tetraoxane derivatives were designed via molecular docking analysis against Falcipain-2 protein and synthesized, Characterize, evaluated for their antimalarial activity. To enhance the antimalarial activity of the tetraoxane moiety, we synthesized a hybrid molecule (“Tetraoxaquine”) consisting of two pharmacophores, 1,2,4,5-tetraoxane and 7-chloro-4-aminoquinoline. These synthesized tetraoxaquine hybrid molecules showed excellent in vitro activity against chloroquine-resistant strains of P. falciparum.

Key words: Antimalarial activity, 1,2,4,5-Tetraoxane Derivatives, P. falciparum, Molecular docking studies, Falcipain-2.

Biography

Dr. Mukesh Kumar Kumawat has completed his PhD at the age of 26 years from Dibrugarh University, Dibrugarh, Assam in Pharmaceutical Sciences. He has more than 13 Years of experience in the field of teaching and research of various Pharmacy Colleges and Univsities of India. He has published 20 papers in reputed National and International journals, 05 Books and 01 Book Chapter with reputed publishers.

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ROLE OF FERMENTATIVE BIOTRANSFORMATION IN DEVELOPMENT OF NEW POLYHERBAL ANTIDIABETIC FORMULATION

Praveen Kumar Gaur

Metro College of Health Sciences & Research, India

Diabetes is a critical metabolic syndrome which reduces quality of life due to serious side effects of current line of treatment. Polyherbal formulations present a viable alternative however larger doses may result in patient incompliance. Potentiation of polyherbals with the insight of long standing traditional knowledge might be a great strategy. Woodfordia fruticosa flowers has been famed for being the source of inoculum in traditionally fermented formulations. Advanced microbial studies revealed presence of biocontrol fungi Wickerhamomyces anomalus in Woodfordia fruticosa flowers.Ayurveda has been a reputed source of therapeutically active antidiabetic herbs. The application of Ayurvedic microbial biotransformation to the combination of antidiabetic herbs will result in potentiation of their antidiabetic potential.The extraction of plants provided a composite extract rich in phytoconstituents. This composite extract was biofermented and when tested in-vivo, was proved to be safe. This composite fermented extract was fabricated into a nanoformulation which was evaluated for physical parameters and stability. Further it was compared with standard antidiabetic treatment. The developed nanoformulation showed significant effect on blood sugar level and reinstated the enzyme levels in pancreas, liver and kidney. The histopathological studies confirmed the restoration of cell structure.The composite extracts are rich in phytocompounds which have their own pharmacological activities. Microbial biotransformation has the potential to chemically modify these phytocompounds and make them more bioavailable, thereby enhancing their therapeutic potential.

Biography

An academician with a keen interest in applied research in the fields of novel drug delivery, Dr. Praveen Kumar Gaur is currently Principal and Professor at Metro College of Health Sciences & Research (MCHSR-Pharmacy), Greater Noida. His research work has resulted in more than 57 international journals of high repute (i.e. Elsevier, Springer, Wiley, Bentham Science, Hindawi etc) along with two books as well as two indian patents. He is serving as editorial board member in various international journals in the field of Nanotechnology, Transdermal drug delivery and Novel drug delivery.

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ARTIFICIAL INTELLIGENCE IN DRUG DISCOVERY- A FOCUS ON CLINICAL RESEARCH COMPANIES

Rashmi Pant

University Department of Chemical Technology, India

The search for novel therapies has long been a challenging process that costs pharmaceutical and clinical research companies a large amount of time and resources.Artificial intelligence (AI) can change the growth scenario of pharmaceutical and clinical research industry more than any other technology.More than 200 clinical research companies worldwide offer which have capabilities in the area of Drug Discovery, Pre-clinical, Phase I-IV clinical trial services are adopting artificial intelligence as their key technology. Majority of the drug discovery clinical research companies' chain have preference of artificial intelligence use artificial intelligence platforms.Plentiful funding and finance deals in the pharmaceutical and clinical research industry for artificial intelligence tools which includes a lot of start ups too is in indicator of the need to develop new drug therapies at a fast pace.Around US $3700 million was raised by 14 start -up companies alone in drug discovery for artificial intelligence for their IPO, initial public offering in the period of Feb 2020 -April 2021.This has created a trend in partnerships and collaborations of pharmaceutical and biotech companies with clinical research companies for artificial intelligence globally which have revenues starting from US$ 1 million to as high as US$ 1 billion. At least 15 global partner ships exceeding US$ 500 million between pharmaceutical and drug discovery companies from April 2019- April 2021 have been executed.Ultimately, the diverse range of AI applications being explored could help tackle the ultimate challenge that developing new drugs, from target identification through clinical trials, requires years of time and billions of dollars.

Biography

Rashmi Pant is a leader in the market research consulting space, helping companies derive optimal market intelligence from available proprietary and secondary desk research. With over 22 years of experience and associations with Torrent Pharma, Intas Pharma, Sun Pharma Advanced Research Company, Veeda Clinical Research, and Cliantha Research, she has accumulated deep marketing intelligence based on comprehensive data analytics. She advises pharmaceutical and clinical research companies from UK, USA, and India in attaining a strategic perspective for discovering optimal, unexplored, and sustainable growth opportunities. Her expertise is in secondary desk research, market intelligence, and strategic marketing. She teaches market research, strategic marketing, business communication and pharmaceutical management courses at Gujarat University's BK School of Management, Amity University, Shanti Business School, and Xcellon to both full-time students and working professionals. To know more visit https://www.rashmipant.com/about-us/.

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DRUG REPURPOSING: INSIGHTS FROM RESEARCH ON CORONAVIRUS GENOME

Tikam Chand Dakal
Mohanlal Sukhadia University,India

Department of Biotechnology, Mohanlal Sukhadia University, Udaipur (INDIA) SARS-CoV-2 is a highly contagious virus that has caused serious health crisis world-wide resulting into a pandemic situation. As per the literature, the SARS-CoV-2 is known to exploit human ACE2 receptors (similar to previous SARS-CoV-1) for gaining entry into the host cell for invasion, infection, multiplication and pathogenesis. However, considering the higher infectivity of SARS-CoV-2 along with the complex etiology and pathophysiological outcomes seen in COVID-19 patients, it seems that there may be an alternate receptor for SARS-CoV-2. I performed comparative protein sequence analysis, database based gene expression profiling, bioinformatics based molecular docking using authentic tools and techniques for unveiling the molecular basis of high infectivity of SARS-CoV-2 as compared to previous known coronavirus. My study revealed that SARS-CoV-2 (previously known as 2019-nCoV) harbors a RGD motif in its receptor binding domain (RBD) and the motif is absent in all other previously known SARS-CoVs. The RGD motif is well known for its role in cell-attachment and cell-adhesion. My hypothesis is that the SARS-CoV-2 may be (via RGD) exploiting integrins, that have high expression in lungs and all other vital organs, for invading host cells. However, an experimental verification is required. The expression of ACE2, which is a known receptor for SARS-CoV-2, was found to be negligible in lungs. I assume that higher infectivity of SARS-CoV-2 could be due to this RGD-integrin mediated acquired cell-adhesive property. Gene expression profiling revealed that expression of integrins is significantly high in lung cells, in particular αvβ6, α5β1, αvβ8 and an ECM protein, ICAM1. The molecular docking experiment showed the RBD of spike protein binds with integrins precisely at RGD motif in a similar manner as a synthetic RGD peptide binds to integrins as found by other researchers. SARS-CoV-2 spike protein has a number of phosphorylation sites that can induce cAMP, PKC, Tyr signaling pathways. These pathways either activate calcium ion channels or get activated by calcium. In fact, integrins have calcium & metal binding sites that were predicted around and in vicinity of RGD-integrin docking site in our analysis which suggests that RGD-integrins interaction possibly occurs in calcium-dependent manner. The higher expression of integrins in lungs along with their previously known high binding affinity (~KD = 4.0nM) for virus RGD motif could serve as a possible explanation for high infectivity of SARS-CoV-2. On the contrary, human ACE2 has lower expression in lungs and its high binding affinity (~KD= 15nM) for spike RBD alone could not manifest significant virus-host attachment. This suggests that besides human ACE2, an additional or alternate receptor for SARS-CoV-2 is likely to exist. A highly relevant evidence never reported earlier which corroborate in favor of RGD-integrins mediated virus-host attachment is an unleashed cytokine storm which causes due to activation of TNF-α and IL-6 activation; and integrins role in their activation is also well established. Altogether, the current study has highlighted possible role of calcium and other divalent ions in RGD-integrins interaction for virus invasion into host cells and suggested that lowering divalent ion in lungs could avert virus-host cells attachment.

Biography

Dr. Tikam Chand Dakal has completed his PhD at the age of 32 years from University of Modena and Reggio Emilia, Italy and postdoctoral studies from Montreal University, Canada & Bordeaux University, France. Currently, Dr. Dakal is Group Leader of Genome & Computational Biology Lab at Mohanlal Sukhadia University, Udaipur, Rajasthan (India).. He has published more than 50 papers in reputed journals and has been serving as an editorial board member of some reputed journals.

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PREDICTION OF DRUG EFFICACY FROM TRANSCRIPTIONAL PROFILES WITH DEEP LEARNING

Zhengwei Xie

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Drug discovery focused on target proteins has been a successful strategy, but many diseases and biological processes lack obvious targets to enable such approaches. Here, to overcome this challenge, we describe a deep learning–based efficacy prediction system (DLEPS) that identifies drug candidates using a change in the gene expression profile in the diseased state as input. DLEPS was trained using chemically induced changes in transcriptional profiles from the L1000 project. We found that the changes in transcriptional profiles for previously unexamined molecules were predicted with a Pearson correlation coefficient of 0.74. We examined three disorders and experimentally tested the top drug candidates in mouse disease models. Validation showed that perillen, chikusetsusaponin IV and trametinib confer disease-relevant impacts against obesity, hyperuricemia and nonalcoholic steatohepatitis, respectively. DLEPS can generate insights into pathogenic mechanisms, and we demonstrate that the MEK–ERK signaling pathway is a target for developing agents against nonalcoholic steatohepatitis. Our findings suggest that DLEPS is an effective tool for drug repurposing and discovery.