BANGALORE HEALTHCARE SUMMIT - 2018

WORLD CANCER CONGRESS

DRUG DISCOVERY AND DEVELOPMENT

25 - 26 September, 2018

Royal Orchid Resort & Convention Centre,
Bangalore, Karnataka, India

PROGRAM AND ABSTRACT BOOK

Organised By

RAYTHEON HEALTHCARE

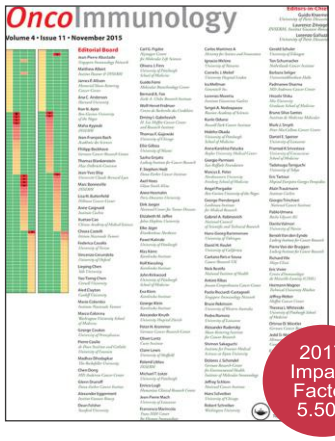
ARJYOPA HEALTHCARE

Taylor & Francis Group
an **informa** business

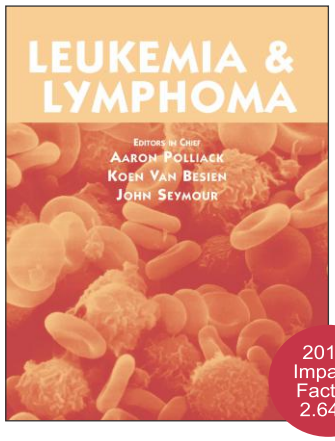
Taylor & Francis ONCOLOGY JOURNALS

Taylor & Francis Group works in partnership with editors, societies, associations, and librarians to publish crucial research in the field of medicine. Our Oncology collection covers a wide range of topics to provide an excellent foundation for research and teaching in the field

FEATURED JOURNALS



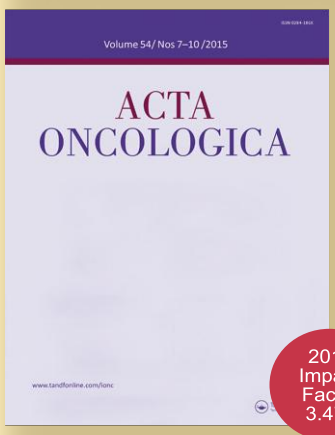
2017 Impact Factor 5.503



2017 Impact Factor 2.644

2017 Impact Factor 3.373

FREE ACCESS



2017 Impact Factor 3.473

Log on to www.tandfonline.com/ionc to access the latest issue of the journal for **FREE**

Publish your oncology research in just 3 weeks with the Expert Collection

The Expert Collection now o\|ers the fastest publication speeds in the industry through fast track service M crucial for sharing the latest advancements in all areas of hematological oncology, from treatment updates to novel diagnostics.

Get in Touch

For any query, contact us at:

Sonali Bhardwaj
Manager | Journals | Libraries & Institution
email: sonali.bhardwaj@tandfinda.com
phone: +91 (11) 43155192

***Free access till 31st December 2018**

Explore now:
https://bit.ly/1Ksfa9q
Scan QR code TODAY for instant access

ORGANIZING COMMITTEE

CHAIRMAN

Dr. Biswanath Majumder
Mitra Biotech

CONVENOR

Aruna Das
Arjyopa Healthcare

Partha J. Das
Raytheon Healthcare

ADVISORY BOARD

Dr. Arkasubhra Ghosh
GROW Research Laboratory

Dr. Ajith V. Kamath
Mitra Biotech

Dr. Jayanta Haldar
JNCSAR

Dr. Aditi Chatterjee
Mitra Biotech

Dr. Padmaparna Chaudhuri
Mitra Biotech

Dr. Birandra K. Sinha
NIH

CONTENTS

Chairman Message	1
Speakers Abstract	2 - 21
Oral Presenter Abstract	22 - 36
Poster Presenter Abstract	37 - 52

Chairman's Message

Dear Delegates,

On behalf of the organizing committee, I deemed it a great privilege to welcome all of you to the 2nd World Cancer Congress to be held on 25th and 26th of September 2018 at Bangalore. In a rapidly changing clinical landscape, cancers emerge as heterogeneous disease where tumor micro environment mimics the diversity of a global ecosystem and underpins limited success of existing treatment paradigms. Drug discovery and development in an era of precision medicine and deep learning is affected owing to lack of proper preclinical de-risking and intelligence tools. Shortage of effective patient matched therapeutics with low toxicities and affordable prices hinder the efforts of rationalization of therapy combinations in the personalized settings. The purpose of this two days meeting is to bring young investigators and research scholars, established academic, industry and business leaders together and make a convergent cross disciplinary forum to address challenges and opportunities. We welcome you all to Royal Orchid Resort & Convention Centre, Bangalore and hope you enjoy this scientifically stimulating meeting.

Dr. Biswanath Majumder

Chairman
Bangalore Healthcare Summit 2018

PLENARY & INVITED SPEAKERS

Keynote

Inhibition of DNA repair as a strategy to treat cancer

Prof. Sathees Raghavan

Professor, Department of Biochemistry,
Indian Institute of Science, Bangalore

Repair of DNA breaks is critical for the maintenance of genomic integrity. DNA double-strand breaks (DSBs) are the most deleterious types of DNA damage. Nonhomologous end joining (NHEJ) is the predominant DNA DSB repair pathway in higher eukaryotes. DNA Ligase IV is one of the most critical components of NHEJ, involved in final sealing of DSBs. Inhibition of DSB repair pathway proteins can be used as a strategy to induce apoptosis in cancer cells. We have chemically synthesized and characterized a novel inhibitor of Ligase IV, SCR7. Using DNA mimicking various *in vivo* DSBs, we showed that addition of SCR7 to testicular extracts abolished joining by NHEJ. Further, SCR7 interfered with the joining of DSB ends catalysed by purified Ligase IV. Further using animal models, we find that SCR7 treatment inhibits progression of tumor, resulting in a significant increase in life span in mice. Interestingly, SCR7 impedes tumor progression significantly, when coadministered with radiation. More importantly, we show that when coadministered, SCR7 could reduce the effective dosage of -radiation from 2 Gy to 0.5 Gy, in tumors derived from breast cancer, colon cancer and in B-ALL. Histopathological and immunofluorescence evaluation of tumor and other tissues suggest that the cytotoxicity induced is mostly restricted to the tumor. We also find that encapsulation of SCR7 in micelles can improve its efficacy by ~4-fold. Thus, by using various biochemical and biophysical approaches, we show that SCR7 is a potent inhibitor of DNA repair, which can be effectively used as a chemotherapeutic agent against multiple cancers.

Plenary

New generation of antibiotics to combat antimicrobial resistance

Dr. Jayanta Haldar

Associate Professor, Antimicrobial Research Laborator
Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore

As arsenal of antibiotics dwindle, increasing effort is being focused on the development of novel strategies to tackle drug resistant bacteria. Vancomycin, long considered as the “antibiotic of last resort" for multi-drug resistant (MDR) Gram-positive bacterial infections, has been rendered ineffective by vancomycin-resistant bacteria (VRE, VISA, VRSA). Additionally, vancomycin is inherently inactive towards Gram-negative pathogens (GNPs) because of its inability to cross the bacterial outer membrane (OM). In this talk I will discuss the various semi-synthetic strategies that we have developed to combat both acquired and inherent resistance of bacteria towards vancomycin. Next, I will discuss our strategies towards the design and development of synthetic mimics of antimicrobial peptides (AMP) as an alternative class of antibacterial agents. These AMPs have a different mechanism action compared to most of the conventional antibiotics and we have shown their superior efficacy in tackling AMR. We believe that these synthetically simple designs have high potential in the field of antibiotic development to combat drug-resistant bacterial infections.

Plenary

Regulatory roles of telomere associated proteins in cancer

Dr. Arkasubhra Ghosh

Head of Department, Molecular Signalling and Gene therapy,
GROW Research Laboratory, Bangalore

Telomeric structure and length maintenance is critical for survival of rapidly amplifying cancer cells apart from other growth inducing factors. Consequently, telomerase, the reverse transcriptase enzyme associated with telomere length extension is upregulated in more than 90% of all cancers. The telomere protects chromosomal ends by adopting a quaternary structure with the help of a unique set of proteins called the Shelterin complex. Shelterin, is composed of six core members that include, TRF1, TRF2 (Telomeric Repeat binding Factor 1 and 2), TIN2 (TRF1- and TRF2-Interacting Nuclear Factor 2), POT1 (Protection Of Telomeres 1), TPP1 and RAP1 (Repressor/Activator Protein 1) in mammals. The expression levels of several components of the shelterin proteins are altered in various human cancers. Rap1 is recruited to the telomere by its binding partner TRF2. We demonstrate that both Rap1 and Telomerase regulate a primary cellular regulator of inflammation, the NFkB transcription factor. Further, higher levels of Rap1 corresponds with increasing grades of tumor and the DNA damage response. Rap1 regulated cellular signalling in response to genotoxic stress in vitro and in vivo and is physically associated with DNA damage repair proteins. In independent cohorts of breast cancer, retinoblastoma and oral cancer, we observed Rap1 upregulation that correlated with proliferative markers. Thus, Telomerase and Rap1 may thus have extra-telomeric adapter functions in the cell associated with aggressive and treatment resistant forms of cancer, thereby presenting novel

Plenary

Development of resistance to chemotherapy Drugs

Dr. Birandra K. Sinha
Scientists
IIDL, NIEHS, NIH,
Research Triangle Park, North Carolina, USA,

Development of resistance to chemotherapy drugs is a major problem in treating human malignancies in the clinic. One of the main mechanisms identified to account for multi-drug resistance (MDR) is the overexpression of drug efflux proteins, including P-170 glycoprotein (Pgp), an ATP-dependent efflux protein. Based on our previous studies showing that nitric oxide (●NO) or its related species inhibit the ATPase activities of topoisomerase II, we hypothesized that ●NO should also inhibit the ATPase activity of Pgp protein and increase drug accumulation in MDR tumor cells, causing a reversal of drug resistance. We found that ●NO or its related species inhibits Pgp activity in NCI/ADR-RES tumor cells, resulting in significant reversal of adriamycin and taxol resistance in the MDR tumor cells, without affecting drug cytotoxicity in the sensitive tumor cells. While no significant effects were observed in the sensitive tumor cells, the reversal of adriamycin resistance is due to ●NO enhancement of the accumulation of adriamycin in the MDR cells. While ●NO had no significant effects on topoisomerase II-induced adriamycin-dependent DNA cleavage complex formation, it significantly inhibited adriamycin-induced DNA double-strand breaks, indicating that topoisomerase II-dependent DNA damage was not responsible for this reversal of ADR resistance. However, a small but significant increase in adriamycin-dependent toxic free radical formation was observed in the presence of PPNO, suggesting that toxic free radical formation and subsequent cellular damage may be responsible for the increased cytotoxicity of ADR by ●NO (or its related species) in NCI/ADR-RES tumor cells

Plenary

CLK1 as a novel therapeutic target in gastric cancer using phosphoproteomics and an ex vivo platform CANscript

Dr. Aditi Chatterjee
Senior Scientists, Dept of Cancer Biology,
Mitra Biotech, Bangalore

Gastric cancer is one of the most common gastrointestinal malignancies and is associated with poor prognosis. Identifying proteins from tumor cells could lead to the discovery of clinically useful biomarkers for early detection or therapeutic intervention of gastric cancer. We carried out phosphoproteomic analysis of patient-derived xenograft of gastric cancer primary tissue using TiO_2-based enrichment. Using mass spectrometry-based high-throughput analysis, we identified 1,235 phospho sites belonging to 747 phosphoproteins, including differential phosphorylation of 104 proteins (fold change cut-off ≥ 1.5). Our data indicates that a subset of differentially phosphorylated proteins belonged to alternative splicing machinery, which possibly activated upstream Cdc2-like kinase (CLK1). Spliceosome complex is an important regulatory machinery of gene expression. Studies in various cancers have reported perturbations in spliceosome complex proteins resulting in differential expression of oncogenes and tumor suppressor genes. Inhibition of CLK1 resulted in decrease in oncogenic property of gastric cancer cell lines. CANscript™ is a platform that uses multi-disciplinary systems to rereate a tumor's microenvironment ex vivo and provides assessment of drug(s) response tested for a given tumor and generates clinically relevant predictions. Tumor samples from gastric patients were analyzed using CANscript to predict response to CLK1 inhibitor. Taken together our data indicates CLK1 can act as a novel therapeutic target in gastric cancer.

Plenary

Lung cancer targeted therapy using grafted peptides.

Dr. Seetharama D. Jois
Assistant Professor, School of Pharmacy
University of Louisiana at Monroe, USA

Genotype-driven therapy or targeted therapy approaches are promising treatments for different types of cancer. Lung cancer is the second most common type of cancer that occurs in both men and women and is the leading cause of death. Nearly 85% of lung cancer patients have a type of cancer called non-small-cell lung cancer (NSCLC). Despite the development of targeted therapy using tyrosine kinase inhibitors (TKI) as well as humanized monoclonal antibodies, the survival rate for lung cancer patients has not improved significantly, and patients inevitably become resistant to therapy. *HER2* gene amplification and HER2 protein overexpression or mutation seem to play a major role in the development of resistance in NSCLC therapy. The protein HER2 is known to interact with other EGFRs and form dimers/heteromers. We have designed novel peptidomimetics that are targeted to HER2 protein and specifically inhibit dimerization of HER2 with other EGFR receptors. To enhance the in vitro and in vivo stability and oral administration of peptides, we have grafted this peptide onto sunflower trypsin inhibitor template. The molecule designed is a dual inhibitor of EGFR-HER2 and HER2-HER3 dimerization. It is known that the coexpression of EGFR and HER2 has been associated with a significantly shortened overall survival rate of lung cancer patients. Thus, inhibition of both dimers is advantageous for patients whose tumor co-express EGFR and HER2 in high amount. The molecules we designed exhibit antiproliferative activity in HER2 + lung cancer cells at nanomolar concentration and exhibit thermal and enzymatic stability. Preclinical and stability studies related to the peptides and peptidomimetics designed for non-small cell lung cancer will be discussed. Research reported in this publication was supported by National Cancer Institute of the National Institutes of Health under award number 1R15CA188225-01A1.

Plenary

Melatonin and estradiol-17 β protect against clomiphene citrate - induced adverse effects on ovary and oocytes

Dr. Shail K. Chaube
Professor, Cell Physiology Laboratory
Institute of Science, Banaras Hindu University, Varanasi

The clomiphene citrate (CC) is a first line of drug used for ovulation induction in anovulatory women worldwide. Although CC has good ovulation induction ability, the pregnancy rate is much lower. Such a discrepancy could be due to the peripheral anti-estrogenic effect of clomiphene citrate and generation of reactive oxygen species (ROS) particularly at the level of ovary. The possible mechanism by which clomiphene citrate exerts its adverse effects at the level of ovary and oocytes remains poorly understood. Using rat as an animal model, we investigated that clomiphene citrate induces apoptosis in granulosa cells that are responsible for estradiol synthesis. The reduced estradiol level in the ovary resulted in poor development and maturation of oocytes that reduced ovary weight, ovulation rate and induced egg apoptosis. CC treatment increased hydrogen peroxide level and reduced catalase activity in ovary, increased bax protein expression and DNA fragmentation in cumulus-granulosa cells as well as in ovulated eggs and induced morphological features characteristics of egg apoptosis. Supplementation of melatonin or estradiol -17 β reduced hydrogen peroxide level in ovary, delayed meiotic cell cycle progression in follicular oocytes and in ovulated eggs since extrusion of first polar body was not completed even after ovulation. Both drugs protected against clomiphene citrate-induced generation of ROS, reduced catalase activity, morphological apoptotic changes in ovulated eggs. Thus, supplementation of melatonin or estradiol -17 β along with clomiphene citrate could be beneficial to retain oocyte quality and to improve reproductive outcome during assisted reproduction in human.

Plenary

Cancer Genetics, Risk Factors, and Stem Cells Research – A Frontier in Medicine of 21st Century

Dr. Ajit K. Saxena
Professor & HOD, Dept of Pathology
All India Institute of Medical Science, Patna

Cancer is a highly complex disease, presenting several challenges to scientists regarding management in developing countries. In India alone, there are over 4 million cancer cases every year. According to the National Cancer Registry Programme of ICMR, Bihar has the 3rd highest incidence rate of cancers, primarily the malignancies of craniofacial region, gall bladder and liver, in India. Accumulation of a series of genetic and epigenetic changes in cells lead to altered phenotypic manifestations due to changes in gene activity, which ultimately leads to generation of a group of cells with the ability to disregard the normal signals to proliferate and differentiate, as well as evade apoptosis, and enhanced angiogenesis, thus leading to development of cancer. Genetic heterogeneity in cancer is greatly influenced by diversified populations, and interactions between genes and environment. Mutational events that cause a change in the cellular response to various external/internal carcinogens, disruption of gene regulation, and modified response to various cytokines, hormones, growth factors and immune responses also play a major role in cancer pathogenesis (Ponder, 2001). Regional, cultural, and environmental differences (ecological niche) including lifestyle, work environment, and dietary choices also contribute to the development of different kinds of cancers in adults and paediatric age group. While there has been a lot of investigation regarding the molecular profiling of various adult tumours, there is a severe lack of scientific information regarding pathogenesis of cancers of paediatric age group in India. Among the several paediatric tumours, Wilms' Tumor (WT) is a rare cancer of kidneys which develops during early embryogenesis. The development of WT involves chromosomal aberrations and functional loss of genetic material whose role, though not clear, may possibly be significantly involved in malignant transformation. While WT is surgically treatable in almost every case, there remains a glaring shortage of information with regard to the genes responsible for pathogenesis, interactions between those genes, as well as the involvement of factors in development of metastasis and recurrence. “Risk Factors” including those involved in the folate metabolism in WT cases still remain elusive as well. With this rationale, we performed several cytogenetic and molecular studies on Wilms' Tumor. Interestingly, loss of Y-chromosome, presence of ring chromosomes, translocation, and various other structural and numerical variations were observed by us during karyotype analysis. PCR based analysis using gene specific sets of primers demonstrated the presence of mutations in the two genes widely implicated in WT – WTI and WTII. Notably, it was found that the frequency of WT1 (15%) mutation was three times higher than that of WTII (5%) in our samples. MTHFR C677T gene polymorphism analysis was conducted to assess the genetic heterogeneity and “risk factor” involved in WT cases, using ARMS-PCR. The results showed changes of allele C→T, which increases “risk” of the disease. Further, DNA sequencing yielded information about “novel mutations” in MTHFR gene, which had not been reported earlier in WT cases in the Eastern part of India. Since WT is an embryonic tumor, there may be an involvement of dysfunctional stem cells in the development of the disease, and therefore, PCR analysis of stem cell transcription factors Oct-4, Sox-2 and Nanog were also performed. We observed the presence of differential expression of Oct-4, and presence of mutation of Sox-2, which possibly plays a role in tumor transformation and activation of oncogenes as a result of subtle changes observed during cytogenetic analyses. Similar studies were carried out by us in adult tumours like Gall bladder, Pancreas, Breast and Ovarian cancer also. In case of gall bladder cancer, SNP analysis of MTHFR by ARMS-PCR showed presence of mutant alleles “T” and copy number variations of DNA. In case of breast cancer, presence of both mutant CT allele as well as rare TT allele was observed, along with both downregulation and upregulation in individual cases. Presence of mutant homozygous allele was also observed in case of pancreatic cancer. On the other hand, in case of ovarian cancer, only wild type CC alleles were observed but there was a marked reduction in copy number of cases with respect to controls. The mutation of Kras (oncogene), as observed in ovarian cancer might also play a role in cancer in tissue specific manner as well as the functioning of Oct-4, Sox-2 and Nanog in a tumor-specific manner. Mutational analysis of these stem cell transcription factors showed reduced Oct-4 gene copy number in ovarian cancer, while there was increased copy number in case of all other cancers investigated. In case of Nanog, DNA copy number was reduced in breast and ovarian cancer. Ovarian cancer also shows reduced copy number of Sox-2, while breast cancer shows increased copy number. These data suggest a definite role of several genetic and epigenetic factors in pathogenesis of cancer in a region-specific manner. However, further analysis with increased sample size is required to shed further light on the involvement and interactions between genes, stem cells, risk factors and environmental factors.

Thought Leader

CANscript: A patient derived ex vivo platform for individualized cancer

Parker Cassidy
CCO, Mitra Biotech
Woburn, Massachuessets, USA

Cancer treatment and management is undergoing a rapid transition from conventional and targeted therapy to precision medicine and very recently to a tsunami of immunotherapy. Matching this momentum, deep learning and high dimensional functional biology driven interrogation is emerging as promising new frontiers. However, owing to complex biology and multiple molecular and mechanistic underpinnings of diverse tumor ecosystem, relying on a single biomarker for predicting individualized response did not result in expected improvement in treatment outcome and overall survival for most of the cancers. Of the same note, strategies like next generation sequencing, circulating tumor cells and cell free circulating DNA did not improve the therapeutic opportunity for selecting optimal drugs. CANscript is a personalized functional platform in which patient tumor micro-environment, heterogeneity and dynamic immune network have been contextually preserved and showed very strong predictive power in clinical scenario where most of the other strategies failed to deliver actionable results. Besides helping oncology and immunooncology late phase drug development, this platform critically offers a predictive Score with high negative and positive predictive value. The clinical validation of this individualized assay system for immune checkpoint inhibitors will further help assessing its impact in clinical decision making. Findings from freshly cultured solid tumor slices without disruption of a spatial-temporal functional milieu in this platform in a population of multiple cancer types and drug regimens highlighted that CANscript positions as a novel technology in the rapidly changing precision medicine landscape. By enabling a reliable prediction, this technology offers matching right therapy for individual patient in a clinically challenging situation.

Invited

P53 polymorphism and association of HPV in oral submucous fibrosis & oral squamous cell carcinoma – A case control study

Dr. Kaveri Hallikeri
Professor, Department of Oral Pathology
SDM College of Dental Sciences & Hospital, Dharwad

The tumor suppressor p53 protein is inactivated by the HPV E6 oncoprotein, it causes polymorphism of the p53 at codon 72 of exon either Proline (Pro) or Arginine (Arg). Specific allele predisposition has been reported in the literature.[1] Various authors have reported presence HPV in premalignancy & malignancy.[2,3] The association between the p53 allele & HPV types has been reported by various authors.[4-9] We analyzed the association between p53 polymorphism at codon 72 and HPV 16 & 18 genotypes in control, oral submucous fibrosis (OSF) & oral squamous cell carcinoma (OSCC). Total 90 cases with each group consisted of 30 cases OSF, OSCC and age –sex matched control, biopsy tissue was collected to extract DNA. PCR was used detect HPV 16 & 18 and alleles of codon 72 in p53 were evaluated in all the samples. In control, OSF & OSCC showed presence HPV 63.3% (19/30), 33.3% (10/30) & 60% (18/30) respectively. In OSF 16 & 18 were detected in four & four cases respectively. Whereas in OSCC HPV 16 & 18 was detected in 10 & 9 cases respectively. In all three groups predominantly Arg/Arg protein was present followed by followed by Pro/Pro & Arg/Pro. Among the control A/A type protein was frequently seen followed by A/P, P/P in the presence of HPV. In OSF Arg/Arg was seen predominatly in association with HPV, whereas the OSCC group, presence of HPV revealed homologous genes associated Pro/Pro & Arg/Arg compared to heterozygous type Arg/Pro. Presence of HPV in control indicates the latent infection. The definite association between p53 codon 72, polymorphism & HPV 16 & 18 was seen in OSCC with low frequency in OSF. Frequency of homozygous genotype is at high risk in the presence of HPV 16 & 18 in developing OSCC.

Invited

Activated Salivary MMP-2 – A Breast Cancer Marker

Prof. Amitava Chatterjee
Emeritus Professor
Ramakrishna Mission Vivekananda Educational & Research Institute, Kolkata

MMP-2 is strongly associated with the progression of malignancy of several types of carcinoma. It has been reported that MMP-2 is involved in the pathogenesis of breast cancer . Human saliva is a biological fluid of varying diagnostic potential with several advantages. The main objective was to detect breast cancer marker from biological fluids (like saliva, urine) using non-invasive method. Here we report that saliva of breast cancer patients show increased expresson and activity of MMP-2 compare to non breast cancer patients. Expression of appreciable amount of salivary MMP- 2 may be a potential marker for breast cancer. Interestingly the urine of the same breast cancer patients showed no MMP activity. The TIMP-2 conc in saliva is much higher in post surgical condition than pre surgical condition. The VEGF conc in saliva is much higher in pre than post surgical condition. Aims- Detection and comparison of MMP-2 expression and activity in saliva of breast cancer patients in pre surgical conditions with the non breast cancer patients saliva. Methods- Zymography, Immunoblot, ELISA, Immunoprecipitetion. Results- Increased expression and activity of MMP-2 was detected in saliva of breast cancer patients before surgery compare to non breast cancer patients. Several control saliva of non breast cancer patients and non cancer patients show no aappreciable reduced background activity . Conclusion- Increased expression and activated salivary MMP-2 of breast cancer patients could be a potential breast cancer marker from saliva using non invasive method.

Invited

Primary Angiosarcoma of the Breast: A Case Report

Dr Deepak M Kamle
Professor & Head, Department of General Surgery
Miraj Medical Centre, Miraj

Primary Angiosarcoma of the Breast is extremely Rare.Often we hardly gets some radiological Findings to suspect the disease.Almost 65% cases the findings are within normal limit.The Prognosis is usually poor because of High Rate of Local recurrences and early development Of metastasis.Surgical removal of breast followed by Adjuvant chemotheraphy seems improve The prognosis. We report a case of a 58 yrs old woman with a highly vascular mass in her right Breast which is suggestive of malignancy at radiology which was subsequently confirmed by a FNAC. Patient underwent a Right Modified Radical Mastectomy(AECHINCOLOS TYPE)under General Anaesthesia.The tumor histology showed papillary formations and vascular structures lined by atypical cells with atypical cells with hyperchromatic nucleus and eosinophilic cytoplasm with solid areas. The tumor cells expressed CD 34 and CD 31 but wewre negative for cytokeratin.The diagnosis of Angiosarcoma grade iii was made.The patient has completed the Radiotheraphy and the patient Is now receiving chemotheraphy.Patient is still alive and doing very well.

Invited

VEGF -460C/T (rs833061) and MMP-3 Promoter -1171 5A- > 6A (rs3025058) Nucleotide Polymorphisms as Potential Biomarkers in Oral Submucous Fibrosis

Dr. S. V. Hiremath
Principal
P. C. Jabin Science College, Bangalore

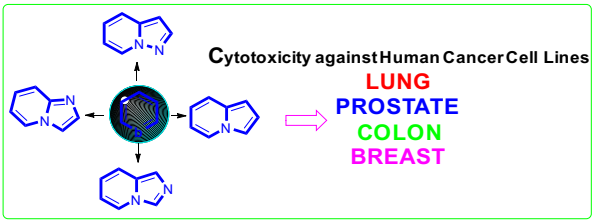
Oral Submucous Fibrosis (OSMF) is one of the oral potentially malignant disorders presenting with progressive restriction in mouth opening. The condition having a high malignant transformation rate necessitates identification of biomarkers to be employed for early detection of malignant change. This will influence the prognosis in addition to adding better quality of life to patients. Basic fibroblast growth factor, placental growth factor, transforming Growth Factor and Vascular Endothelial Growth factor (VEGF) are few among the various tumor growth factors assessed cancer biomarkers to detect early changes. Likewise, MMP-3 also known as Stromelysin -I is a key member of the MMP family which is responsible for degradation of collagen type II,IV,V,IX and X, proteoglycans, gelatins, fibronectin, laminin and elastin. It plays an important role in activation of pro MMP-1 into the active form of MMP-1 in malignant tissues. MMP-3 expression is low in normal tissues but it is altered during tumour formation, where remodeling of ECM is required. Thus, we conducted two cross-sectional case control studies with the purpose of evaluating the association of VEGF -460C/T polymorphism (rs833061) and MMP-3 promoter -1171 5A- > 6A polymorphism (rs3025058) in patients suffering from Oral submucous fibrosis. The main aim and objective of these studies was to correlate the association of polymorphisms in the VEGF and MMP-3 genes in OSF patients and healthy individuals (controls) and to assess the association of single-nucleotide polymorphisms of patients with oral submucous fibrosis. For detection of VEGF -460C/T and polymorphism, 30 patients with OSMF and 20 controls free from habits and any form of lesions were included in the study. Similarly separate group of 30 patients with OSMF and 20 controls free from habits and any form of lesions were included in the study were included to assess MMP-3 promoter -1171 5A- > 6A polymorphism. For VEGF -460C/T and polymorphism 6.67% of the subjects from OSMF group showed CT polymorphism and 16.67% showed TT polymorphism. There were no statistically significant differences in the polymorphism between the study group and controls. However the frequency of T allele in the patient group 12 (20%) was greater than that in the control group 1 (2.5%), which was a significant finding. There was no association between the habits, frequency of habits, duration of quid placement, site of quid placement and style of chewing with the nature of polymorphism. Similarly for MMP-3 promoter -1171 5A- > 6A showed a statistical significance difference between the duration of habit and disease severity with polymorphisms. The result also showed a higher frequency of the 5A allele in the study group as compared to the controls.

Invited

Synthesis and Functionalization of Pyridine Bridged Heterocycles: Biological Evaluation towards Human Cancer Cell lines

Dr. Subbarayappa Adimurthy
Principal Scientist
CSIR-Central Salt and Marine Chemicals Research Institute, Gujrat

Pyridine derivatives play a significant role in the syntheses of fused nitrogen containing heterocycles.[1] Heterocycles derived from pyridine bridged substrates including imidazo[1,2–a]pyridines, imidazo[1, 5-a]pyridines, imidazo[1,2–a]pyrazines, indolizines, imidazo[2,1–a]isoquinolines and pyrazolo[1, 5–a]pyridines are important intermediates in both medicinal chemistry and drug development.[2] Particularly, pyrazolo[1, 5-a]pyridines exhibit various biological activities such as 5HT3-adenosine antagonists, p38 kinase inhibitors, dopamine D3/D4 agonists, antagonists 2, 4-antiherpetic agents, and potent treatments for cardiac arrhythmias



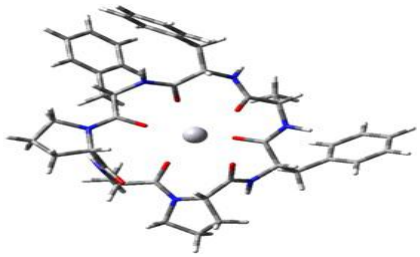
In view of the importance of such molecules, we present here, the synthesis and biological activities of the pyrazolo[1, 5-a]pyridines[4] and in particularly these compounds have been evaluated against various human cancer cell lines A549 (Lung adenocarcinoma cell line), MCF-7 (Breast carcinoma cell line), HCT-116 (Colon cancer cell line), and PC-3 (Prostate cancer cell line) through SRB assay. One of the compound showed high activity at 1.54 µM concentration and led to accumulation MCF-7 cells in G1-phase and revealed its important role in mitotic cell cycle progression.

Invited

Marine sponge derived cyclic peptides, their heavy metal affinity and druggability prospects

Dr. Arpita Yadav
Assistant Professor, Molecular Medicine
St. John's Research Institute, Bangalore

A number of naturally occurring marine sponge derived cyclic peptides and their synthetically feasible analogs have been considered in this study for their prospective medicinal uses. A number of peptides cyclic and non cyclic have been researched repeatedly for their antibacterial, tumoricidal and anti HIV pharmacological effects with the added benefits of lower proteolytic complications (for cyclic peptides) and biocompatible nature. In this study heavy metal toxicity removal in particular mercury and methyl mercury ions linked to autism in children have been considered by these marine sponge derived cyclic peptides.



If these cyclic peptides possess a reasonable half life they could prove to be ideal option for heavy metal toxicity removal from human body. In addition to mercury and methyl mercury ion removal, the utility of these peptides in removal of other heavy metals like Cd^{2+}, Pb^{2+} etc. has also been studied through ab initio molecular orbital calculations and intermolecular interaction calculations at the HF/CEP-31G level. Analogs of cyclic peptides with enhanced druggability have been designed and analyzed for their projected pharmacological effects. ADME properties have been calculated to estimate their druggability. Our results indicate a variety of applications of these cyclic peptides in bioremediation as well as development of non toxic, biocompatible drugs for reduction of heavy metal overload, reducing oxidative stress and emergency removal of mercury ions.

Invited

Reduction of Drying Cycle Time in the Manufacturing of Active Pharmaceutical Ingredients using Vacuum Dispersion Technique

Dr. R. Suresh
Associate Professor,
M S Ramaiah University of Applied Sciences, Bangalore

The Active Pharmaceutical Ingredients API are the intermediate drug substances needed for the formulation or manufacturing of final drugs under pharmaceutical GMP environment. The final drug is also called as medicine and lifesaving drugs-which is using to treat the patients or cure the diseases. The API Manufacturing is usually a lengthiest and validated process regulated by Central Drugs Standard Control Organization CDSCO and its guidelines. The API process has many sub-processes out of which majority of sub-processes are derived/defined and inhabiting to change. There are few sub-processes has some degree of freedom to change within manufacturing plant as a part of up gradation and continual improvement. The Vacuum Drying process is ideally a final and bottleneck sub-process. Adaptation of Vacuum Dispersion Technique in Vacuum Drying sub-process is an effort to reduce the existing Drying cycle without disturbing pre-formulated quality. The decades of involvement in the design, design customization and operation of the Vacuum Drying system is encouraging to work on. The Drying cycle time is solemnly depending on moisture evacuation time against temperature. The confidence gained by literatures on the concept of Orifice effect/multi-point vacuum application (Vacuum dispersion) is encouraging factor. This aforesaid concept was validated with one of API drug intermediate Vacuum Drying process. The equipment involved in the validation is Vacuum Tray Dryer VTD 96 Trays. The Vacuum Drying process is obeys the heat and mass transfer process of Thermodynamics under the influence of vacuum. The product loaded in VTD trays is heating-up with the heat radiation via non-contact hot water circulation within enclosed shelves. When the product/mass is warmed, the moisture present is starts transferring with vapor and the same is taken-out condensed. The result achieved is 19 hours Drying cycle time against 22 hours validated Drying cycle time. So the project can be concluded that the Vacuum Dispersion tube with orifice effect is impacting on Vacuum drying cycle time.

Invited

Mn mediated sp2Câ^'H functionalization/C-N/C-O bond formation: A Novel Highly Efficient Synthesis of 2- substituted Benzoxazoles

Dr. Neelima D. Tangellamudi
Faculty, Department of Medicinal Chemistry,
National Institute of Pharmaceutical Education and Research, Hyderabad

Benzoxazoles are an important class of privileged heterocyclic structures that are found in wide range of biologically active and medicinally significant compounds. The only viable methods available for the synthesis of benzoxazoles involve the classical condensation of a 2-aminophenol with either a carboxylic acid or an aldehyde or an intramolecular cross-coupling reaction of a 2-haloanilide precursor. All these above procedures require ortho-disubstituted precursor and harsh conditions like strong acid/high temperature. We developed a novel, highly-efficient method that is experimentally simple and proceeds under mild reaction conditions to afford benzoxazoles in good to excellent yields. The protocol dispenses the need for ortho-disubstituted precursor and allows the sequential formation of C-N and C-O bonds via oxidative dearomatization for the synthesis of 2-benzoxazoles from benzoquinone and glycine/aliphatic amine precursors.

Invited

Man made compounds— Cure or curse the cancer

Dr. P. Murali krishna
Asst. Professor, Department of Chemistry
M. S. Ramaiah Institute of Technology, Bangalore

Cancer is a class of diseases characterized by out-of-control cell growth and is the second most common cause of death after heart disease. The cancer is mainly associated with man made compounds on usage in modern life style. So cancer can be reduced by such compounds/chemicals especially avoiding tobacco, limiting alcohol intake, limiting UV ray exposure from the sun and tanning beds and maintaining a healthy diet, and seeking regular medical care. Even half of the chemicals/drugs consumed in high-dose also causes cancer. The more details how the mane compounds will affect on human health will be discussed in detail in the presentation.

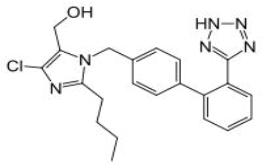
Invited

An efficient and green synthesis of antihypertensive drug losartan

Dr. Santosh L. Gaonkar

Associate Professor, Dept. of Chemistry
Manipal Institute of Technology, Manipal

Losartan[1] is a renowned Angiotensin II receptor antagonist drug used mainly in the treatment of hypertension. Losartan mainly reduces the risk of stroke in patients having left ventricular hypertrophy. Cytochrome P_{450} enzyme convert the inactive losartan to active metabolite carboxylic acid which is responsible for the desired action of the drug. Losartan and its active metabolite inhibit the physiological action of Angiotensin II, by forming bond with AT_1 receptor and decrease the atrial pressure without causing side effects. Losartan is also used in the treatment of diabetic nephropathy, renal insufficiency and in post-myocardial infraction. Losartan is the first non-peptide AT_1 antagonist approved by the U.S. Food and Drug Administration for clinical use. There are number of patents and papers which describe the synthesis of losartan. Most of the synthetic routes use toxic tin reagents for the construction of tetrazole ring.



Losartan

In this paper we have reported tin free green method for the synthesis of losartan potassium. Imidazole aldehyde was condensed with substituted biphenyl compound in presence of Poly ethylene glycol. The condensed product was reduced using sodium borohydride in methanol. The tetrazole ring was constructed using greener reagent TEA.HCl / NaN_3 in ketonic solvent medium without the use of toxic tin reagents. The process is more efficient, greener, industrially scalable and cost effective.

Invited

Contravening effects of Lupeol on multiple clinically aggressive human cancers

Dr. Nabendu Murmu

Senior Scientific Officer, Dept of Signal Transduction and Biogenic Amines
Chittaranjan National Cancer Institute, Kolkata

The overall prognosis and survival for many aggressive cancers remain very low for decades. Clinically relevant platforms and novel anticancer agents together can improve the treatment outcomes 1,2,3 . To evaluate the anti-cancer effects of Lupeol on multiple aggressive tumors. Methods: Melanoma, breast and oral cancer cell lines and tissues were treated with different doses of Lupeol for 24 and 48 hours. Cytotoxicity assay, tube formation, and sphere formation assay were performed. The expression status of Ephrin A2 were examined. We observed the down regulation of CD133 expression and disrupted tube formation in all Lupeol treated cell lines. Lupeol impaired Cancer Stem Cell(CSC) like properties as evident by the sphere formation and alteration in the CSC pools. Mechanistically, these effects suggested a link with Ephrin A2 and its downstream elements, orchestrating vasculogenic mimicry (VM) in melanoma model. We validated these effects in human oral cancers along with docetaxel induced antiangiogenic response (i.e., loss of CD34) using CANscript TM platform 3 .

Invited

Anti ROR1 Targeted Therapy Effectively Combats Metastasis in Colon Cancer Cell Lines

Dr. Rukkumani Rajagopalan

Assistant Professor, Department of Biochemistry & Molecular Biology,
Pondicherry University, Pondicherry

Cancer still remains an incurable threat owing to a process called metastasis**.** In order to increase the survival rate of cancer patients, it is necessary to effectively improve the treatment for metastasis. The obliteration of metastasis can be achieved by targeted therapy. A novel target in metastatic cancers that has been revealed recently is ROR1 which belongs to the family of tyrosine kinase like orphan receptors (ROR). ROR1 are reported to be over expressed in metastatic cancers and their expression correlates with tumor grade. This receptor is associated with the epithelial-mesenchymal transition that is involved in metastasis. Therefore, targeting the drug specifically to ROR1 would allow a better treatment strategy for metastasis. This receptor can be accessed by coupling the drug vehicle with anti-ROR1 monoclonal antibody. In our study, we utilized the drug, Indole curcumin analog, for treating the metastatic cancer. We used a highly bio-compatible nanoparticle namely Poly (lactic-co-glycolic acid), PLGA. We coupled PLGA with anti-ROR1 mAb to deliver Indole curcumin analog (ICA). Our results showed that anti-ROR1 conjugated Indole curcumin nanoparticles (ICANPs) effectively decreased the markers of metastasis and epithelial to mesenchymal transition (EMT). Down regulation of MMP-2, MMP-9 and COX-2 along with up regulation of Timp-2 was observed in the conjugated drug loaded NP treated group showing the potent antimetastatic effect. Furthermore, down regulation of β-catenin, Vimentin and Notch, along with upregulation of Claudin and E-Cadherin was observed in the cells treated with mAb conjugated ICANP suggesting that the nanohybrids effectively decreased the EMT. From our study, we conclude that the surface functionalization of the drug loaded NPs with ROR1 monoclonal antibody can be a powerful strategy for anti-metastatic therapy.

Invited

Targeted Cancer Nanomedicine: an Advancing Lead Towards Healthcare Strategies

Dr. Radhika Poojari

DBT-Women Scientist, Department of Biosciences and Bioengineering,
Indian Institute of Technology, Bombay

Heterogeneity is a hallmark of cancer. Till date, systemic treatment of cancer has not been effective in most cases and its clinical therapy is a major challenge worldwide. Many conventional antitumor drugs are non-selective for cancerous cells and cause undesirable side effects. Therefore, it is important to search for new therapeutic modalities and novel therapeutic targets to generate safe and effective treatment modalities for this fatal disease. Nanomedicines that can target microtubule cytoskeleton, kinases, tumor vasculature and immune checkpoints could provide new avenues against our most costly and challenging diseases such as cancer. We have developed smart biocompatible biomaterials, targeted polymeric nanoformulations, layerby-layer polyelectrolyte nanoparticles, an one pot synthesized polymeric nanosystem with an imaging probe, and green chemistry based-inorganic delivery modalities. The talk will focus on indepth understanding of the cell-particle interactions, effects on microtubule cytoskeleton and nuclear changes, ultrastructural modulations as well as immuno-modulatory effects would provide a significant insight into the intrinsic molecular interplays of the targeted nanomedicine in liver and oral cancer. The multimodal system signifies integrating several avenues in a nanoscale-platform for drug delivery, combinatorials, high sensitivity quantum dot imaging system, and enhancing the immunotherapeutic response against liver and oral cancers. These innovative strategies would foster as a potential medical advancement in the healthcare settings for the cancer prevention and treatment.

Invited

Incidental carcinoma of gallbladder in north India: is routine histopathology of all cholecystectomy specimens justified?

Dr. Mukesh Kumar Sangwan

Associate professor, General Surgery
Govt med college Khanpur, India

Gallstones can cause varied spectrum of histopathology. Xanthogranulomatous cholecystitis and metaplasia have been shown to have association with carcinoma gallbladder. Incidental carcinoma of the gallbladder is a nightmare for the patient. Routine histopathology of all cholecystectomy specimens is an effective policy for its early diagnosis and management. It is a retrospective study of histopathology of cholecystectomy specimens related to gallstones disease done at a rural government in north India. All patients with preoperative or intraoperative gross malignancy of gallbladder were excluded from study. In our study, females were predominating over males with a ratio of 6.07:1. The mean of all patients was 44.16±14.64 years. Chronic cholecystitis was most common (69.81%) histopathological entity. Incidental carcinoma was also revealed in 1.9 % of the cases. Metaplasia and xanthogranulomatous cholecystitis was reported in about 6% cases. Mixed stones were most common type reported in 76.79% cases. Multiple stones (72.8%) were more common than single stones. Majority (58%) of the cases in our study were operated by laparoscopic technique. Gallbladder perforation was most common complication noticed in about 4.15% cases.

Invited

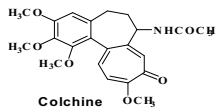
Potential anti-proliferative agents from 2,3-dimethyl benzocycloheptenones-part 3

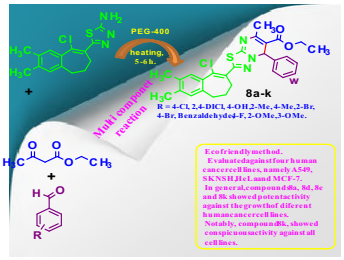
Dr. Lingaiah Nagarapu

Principal Scientist
CSIR-Indian Institute of Chemical Technology, Hyderabad

Benzosuberone nucleus containing natural products represents the medicinal and pharmaceutically important class of compounds because of their diverse range of biological activities. In former years, benzosuberone nucleus embedded with numerous natural products has been isolated. Benzosuberone unit has a core structure of natural products such as Colchicine, Theaflavin, Bussealin E, Demethylsalvicanol, Brussonol and Feveline which were clinically proven as anticancer agents.

Colchicum Autumnale





In view of our interest towards biologically active molecules[2-11] an efficient and eco-friendly method has been developed for the synthesis of 2,3-dimethylbenzocycloheptenone tethered thiadiazolo-pyrimidine carboxylates *via* a multicomponent condensation reaction of benzo[7]annulenyl thiadiazol-2-amines with various structurally divergent aromatic aldehydes and ethylacetoacetate in the presence of polyethylene glycol (PEG-400) and A valuable feature of this method was the design of new hybrid architectures through the adequate fusion of these subunits thiadiazoles or pyrimidines with benzosuberone, generating biological active leads. These synthesized compounds were evaluated against four human different cancer cell lines. Notably, compound **8k** showed prominent activity against all the cell lines. Moreover, efforts are also in progress to improve the antitumor activities of these potential leads, and other biological activity evaluation including antibacterial and antiviral activities are also underway in our laboratory.

Invited

Significance of metastasis related MIRNA in Lymphnode positive Breast Cancer- A microRNA expression profiling study

Dr. V. Gnanapriya
Assistant Professor, Department of Pathology
St.John's Medical College, Bangalore

Effective management of breast cancer depends on early diagnosis and proper monitoring of patients' response to treatment, to prevent metastasis of the tumour. However, these goals are difficult to achieve because of the lack of sensitive and specific biomarkers for early detection and for disease monitoring in the primary tumour which could give an insight into the extent of tumour aggression. Accumulating evidence in the past years has highlighted use of miRNA in Breast cancer diagnosis and prognosis given their structural stability and ease of isolation. In the current study we have examined expression of 4 MIRNA (involved in metastasis) in both primary and corresponding lymph node tumour to identify patterns of expression122 breast tumours of which 70 LN+ve and 52 LN–ve and 54 matched LN tumours were utilized for analysis. Total RNA was extracted and stemloop specific cDNA for MIR10b, MIR21, MIR182 and MIR31 and RU48 as control were prepared and assayed for respective MIRs using Specific Taqman probes for the same by quantitative Real time PCR. Correlations between clinicopathological parameters of breast cancer patients and candidate miRNA expression were elucidated. We compared clinical parameters with age at diagnosis (<=50 y and >50), lymph node metastases, tumour size (<2cm and >=2cm) and stage and also across IHC subtypes of ER+HER2-ve, HER2+ve and Triple Negative Breast cancer (TNBC). Total of 31 TNBC, and 85 non -TNBC were included for analysis. HER2 equivocals were excluded from data analysis. Differential expression for all studied MIRs was observed between TNBC and Non-TNBCs. Interestingly, within LN + tumours, MIR10b, MIR182 and MIR21 (p=0.04), which are known to be associated with Epithelial Mesenchymal Transition (EMT pathway) (REF), were all higher in non-TNBC whereas MIR31 was significantly higher in TNBC (p=0.02) in both LN+ (n=14) and LN-ve (n=17) groups (p=0.021)demonstrating non preference to LN metastasis. No significant correlation to any clinic-pathological parameters and no difference was observed between Primary and matched lymph node tumours.

Invited

Methylation in oral potentially malignant disorders and oral squamous cell carcinoma -A review

Dr. Sarita Yanduri
Reader, Department of Oral and Maxillofacial Pathology ,
DA Pandu Memorial RV Dental College and Hospital, Bengaluru

Oral cancer is a complex disease which is a major public health concern especially in countries like India. It is one of the few cancers which may be preceded by easily identifiable lesions which have the potential to turn malignant such as oral leukoplakia ,erythoplakia, oral lichen planus and oral submucous fibrosis. Though cancer has always been associated with genetic alterations ,there is growing evidence that epigenetic modifications involving factors which are responsible for the causal interactions between genes and phenotype play an extremely essential role in the pathogenesis of this disease. DNA methylation is one of the key epigenetic processes where aberrant DNA methylation often occurs in the promoter regions of specific transcription factors that are involved in the formation and progression of malignant tumours. Hyper- methylation of promoter regions (CpG islands) causes silencing of genes primarily involved in tumour suppression such as genes in cell cycle control, DNA repair, and apoptosis pathways. Hypo-methylation of a CpG dinucleotide in the global DNA sequence causes activation of oncogenes like those involved in cell cycle signalling . The most frequently and extensively studied methylated genes in oral lesions are *p16, MGMT, RARβ, E-cadherin* and *DAP-kinase*. This reversible change is also considered a mechanism by which environmental risk factors, such as tobacco, betel quid chewing , alcohol use and diet may influence disease risk. Oral potentially malignant lesions though indicate the possibility of malignant change, it has been quite difficult to predict which lesions may turn malignant based upon cytology and histopathology alone due to subjective differences. It is in this area that methylation might serve as an early biomarker of the disease. This presentation aims to review the current status of methylation in determining the diagnosis , prognosis and even the therapeutic modalities available for oral precancer and cancer of the oral cavity.

Invited

Therapeutic potential of melatonin and seed extract of a traditional herb *Tephrosia perpura* in modulation of PCO induced reproductive immunity

Dr. Seema Rai
Associate Professor, Department of Zoology
Guru Ghasidas Vishwavidyalaya, Chattisgarh

The present scientific piece of work needs an assessment of the expression of these two receptors in controlled, letrozole induced PCO as well as the treated group of ovarian tissue.Letrozole induced PCO female arts showed a significant increase in serum cytokine level of IL-6 as well as TNF-α indicting the internal inflammation which could be due to the tissue specific pathogenicity of local micro environment and stress induced as well because of the polycystic ovarian condition of the individual animal. Presence of both the receptor MT1 and MT2 were noted expressed in ovarian tissue however MT2 receptor were observed with a very weak expression. Extremely down regulated MT2 expression indicates MT1 as the main modulator in regulation of ovarian physiology in female animal. Further a differential expression of MT1 receptor noted in all experimental groups of rats where letrozole induced PCOs female showed down regulation in MT1 R expression in ovary. Upregulation of MT1 R in ovarian tissue following melatonin injection to the control group provide a clear cut evidence of direct involvement of MT 1 receptor in ovarian physiology specifically during the pathogenicity of PCOS. ER-α receptor were shown very abnormal in the experimental groups when compared with control. The present finding can be correlated with the fact that during PCO condition there is a failure to upregulation of aromatase enzyme in granulose cell therefore estradiol concentration of follicles fails to increase adequately and hence led to the abnormal expression of ER-α.Cytokine receptor expression for IL-6R and IL-2R were noted decreased in the ovaries of PCO rat model. Exogenous melatonin injection however enhanced both the cytokine receptor expression to a significant level. The present finding provides a clear cut evidence of involvement of not only the exogenous melatonin but the impact ofalcoholic seed extract of Tephrosia purpureacan't be ignored. A significant impact and potency equivalent to melatonin in receptor modulation of MT1, MT2 and IL-2R, IL- 6R as well as serum cytokine for IL-6 and TNF-α was noted. Exogenous melatonin treatment and seed extract of Tephrosia purpurea in both the condition alone and in combination showed their involvement in regulation of optimal ovarian weight, hormonal level (T, E, P, Leptin, LH, FSH), LPO, GSH, SOD as well as the cellular architecture of ovary with healthy follicles. We may therefore suggest that these two drugs can be considered as very important therapeutic molecules which may be helpful for the future clinicians in the treatment of pathogenicity of PCOS.

Invited

Quantitative Cell-Based Bioassays to Advance Immunotherapy Programs Targeting Immune Checkpoint Receptors

Gopal B. Krishnan
Global Product Manager – Bioassays
Promega Corporation, USA

The human immune system is comprised of a complex network of immune checkpoint receptors that are promising new immunotherapy targets for the treatment of a variety of cancers and autoimmunemediated disorders. Immunotherapies designed to block co-inhibitory receptors (e.g. PD-1, CTLA-4) are showing unprecedented efficacy in the treatment of cancer. However, not all patients and tumor types respond to this approach. This has resulted in broadening of immunotherapy research programs to target additional co-inhibitory (e.g. LAG-3, TIM-3) and co-stimulatory (e.g. GITR, 4-1BB, OX40, CD40) receptors individually and in combination. A major challenge in the development of biologics is access to quantitative and reproducible functional bioassays. Existing methods rely on primary cells and measurement of complex functional endpoints. These assays are cumbersome, highly variable and fail to yield data quality required for drug development in a quality-controlled environment. To address this need, we have developed a suite of cell-based functional bioassays to interrogate modulation of immune checkpoint receptors individually (e.g. PD-1, LAG-3, TIM-3, GITR, 4-1BB) and in combination (e.g. PD-1+CTLA-4, PD-1+LAG-3). These assays consist of stable cell lines that express luciferase reporters driven by response elements under the precise control of mechanistically relevant intracellular signals. Thus, the bioassays reflect mechanisms of action for the drug candidates designed for each immune checkpoint receptor and demonstrate high specificity, sensitivity and reproducibility. In summary, these reporter-based bioassays can serve as powerful tools in immunotherapy drug development for antibody screening, potency testing and stability studies.

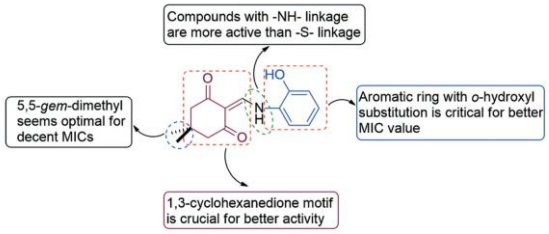
Invited

The synthesis, biological evaluation and structure–activity relationship of 2-phenylaminomethylenecyclohexane-1,3-diones as specific antituberculosis Agents

Dr. Ali Mohd Lone

Assistant Professor, Department of Biochemistry,
University of Kashmir, Jammu & Kashmir

The present study utilised whole cell based phenotypic screening of thousands of diverse small molecules against Mycobacterium tuberculosis H37Rv (M. tuberculosis) and identified the two cyclohexane-1,3-dione based structures as hits. The selected hit molecules were used for further synthesis and a library of 37 compounds under four families was synthesized for lead generation. Evaluation of the library against M. tuberculosis lead to the identification of three lead antituberculosis agents. The most potential compound, 2-(((2-hydroxyphenyl)amino)methylene)-5,5-dimethylcyclohexane-1,3-dione showed an MIC of 2.5 µg mL^{-1}, which falls in the range of MICs values found for the known antituberculosis drugs ethambutol, streptomycin and levofloxacin. Additionally, this compound proved to be non-toxic (<20% inhibition at 50 µM concentration) against four human cell lines. Like first line antituberculosis drugs (isoniazid, rifampicin and pyrazinamide) this compound lacks activity against general Gram positive and Gram negative bacteria and even against M. smegmatis; thereby reflecting its highly specific antituberculosis activity.



Invited

A Future prospects of Nanotechnology & Green chemistry in Diagnostic Imaging and Drug Delivery

Dr Karunendra Singh

Asst. Professor, Department of Applied Sciences
Amity University, Noida

Today the nanotechnology plays an important role not only in the field of diagnostic but also targeting them as drug-delivery systems for a variety of life-threatening diseases. Diagnostic imaging refers to a broad batch of technologies used to examine the body in order to diagnose different diseases. The quick pace of the present world has given rise to a few threats in the field of healthcare. Depression, hypertension, diabetes, tumors and a few contagious diseases are only a fraction of the common issues related to the rapid stress-filled lifestyle. Early disease detection even before symptoms' presence, improved imaging of internal body structure, as well as ease of diagnostic procedures, have been developed with the help of a new branch of laboratory medicine termed as Nano diagnostics. Nanotechnology can improve diagnostic imaging techniques even at the level of single cells before overall symptoms appear. Fusion of nanomaterials with molecular imaging devices permits diagnostic and dynamic processes at the molecular level . Many imaging technologies, for example, Computed Tomography (CT) and Magnetic Resonance Imaging (MRI) and Positron Emission Topography (PET) depend on intravenously administered contrast agents. While the present age of contrast agents has facilitated fast analysis, yet they experience the ill effects of numerous unwanted defects including an absence of tissue specificity and systemic toxicity issues. In this report, we present an outline of the leading technologies presently used for diagnostic imaging and the manner in which nanotechnology is used to upgrade these methods. The synthesis of nanomaterials using green chemistry is very fast, environmentally friendly. These materials are fully biocompatible in nature for biomedical applications. Various metals including Ag, Au, Pt, Cu, and Se, have been used for the synthesis of the corresponding nanomaterials by using green chemistry.

Invited

Nutraceuticals and Their Safety Aspects

Dr. Susmita Chandra

Pool Scientist and Faculty, Department of Biotechnology
Maulana Abul Kalam Azad university of Technology, Bangalore

The term “nutraceuticals” has been used to describe products derived from natural sources that provide additional health benefits beyond the basic nutritional value in foods. These include dietary supplements, functional foods, medicinal foods, and natural products. Such products promote general well-being, control symptoms, and possibly prevent disease progress. The safety assessment of nutraceuticals is an essential part in their development and commercialization.Scientific interventions in different types of nutraceuticals including phytochemicals, polyphenols and flavonoids showed that they have potential protecting effect against cancer, Alzheimer's disease, Parkinson's disease, diabetes, arthritis, including cardiovascular disease, cancer, and neurodegenerative diseases. In the formulation the combined or syner gistic effect of the mixed components are very important for its efficacy. Several models, both *in vitro* and *in vivo*, have been described to evaluate the safety and toxicity issues of nutraceuticals. More recently “*omics*”, “*in silico*” and emerging technologies such as “human, organ, and/or lab in a chip” have also been used. Moreover, nutraceuticals and food ingredients from herbal sources may be contaminated with pesticides, heavy metals mycotoxins, and radioactivity. These toxic contaminants as well as changed quality and safety levels of processed nutraceuticals may change their efficacy. To prevent and screen for contamination, and to ensure the safety and conformity, nutraceuticals and health food ingredients should be included in an appropriate regulatory framework before they reach the consumers.

Finally, it should be noted that more intensive studies are required so that they can contribute significantly toward understanding the mechanism of action of nutraceuticals to serve as screens in understanding the effects of test agents on our complex biological systems.

Invited

Immunohistochemical evaluation of ki-67 and mcm2 proteins at histologically negative surgical margins and invasive tumor front to predict the locoregional recurrence of oral squamous cell carcinoma.

Dr. Kiran Kumar

Associate professor, Dept. of Oral pathology,
SDM college of dental sciences & Hospital, Dharwad

The treatment failures in Oral squamous cell carcinomas (OSCC) patients are mainly due to recurrence leading to poor prognosis. Genetically transformed cells in the adjacent mucosal area thought to be the reason for local recurrences and invasive tumor front (ITF) area is known to host the aggressive tumor cells. Hence, the study conducted to quantify and compare proliferative markers Ki-67 and MCM 2 at histologically negative surgical margins and ITF to predict recurrence and prognosis in OSCC. The study involved paraffin tissue sections of 30 cases of recurrent, 30 cases of non recurrent OSCC and 10 normal mucosa subjected for Immunohistochemical analysis at negative surgical margins and ITF. The mean labelling index (Li) of MCM 2 and Ki-67 was compared among the groups to predict the recurrence and overall survival by statistical analysis. The Li of MCM 2 was significantly higher at negative margins of recurrent OSCC compared to normal mucosa ($P<0.05$) suggesting high cell turnover rate. The Li of Ki-67 and MCM 2 were higher at negative margin and ITF of recurrent group compared to non recurrent OSCC group with statistically significant difference ($P<0.05$) only with MCM 2. Li of MCM 2 at margin and ITF was a better predictor of overall survival than Ki-67. The mean survival was significantly lower to 43.95 months with MCM 2 Li more than 48.2 at margin (Kaplan-Meier curve, Log rank test).

Invited

Evaluation of TWEAK and Fn14 in oral squamous cell carcinoma

Dr.Swetha Acharya

Associate Professor, Department of Oral Pathology
S.D.M.College of Dental Sciences & Hospita, Dharwadl

Tumor necrosis factor-like weak inducer of apoptosis (TWEAK) has been implicated in the pathogenesis of various inflammatory pathologies and cancer. TWEAK is the only Tumor necrosis factor (TNF) super family member that binds to its specific receptor fibroblast growth factor –inducible immediate early response protein 14 (Fn14). The activation of TWEAK/Fn14 signalling enhances the proliferation, invasion and migration of tumor cells. Studies have indicated that the expression of TWEAK and Fn14 is upregulated in many solid tumors compared with healthy tissues. However, the expression of TWEAK/Fn14 and their potential role in oral squamous cell carcinoma (OSCC) has not been dealt in depth so far. This investigation aimed to study the expression of TWEAK and Fn14 in OSCCs, in order to elucidate possible role of TWEAK/ Fn14 in OSCC development. Immunohistochemistry for TWEAK and Fn14 was performed on the tissues of 31 OSCC patients who underwent surgical excision in our institution. Staining intensity, extent of staining and Immunoreactive score was assessed for each case. The data was subjected to statistical analyses. **Results**: All OSCC samples expressed TWEAK and Fn14 expression was noted in 90% of OSCC. A statistically significant difference in the TWEAK and Fn14 expression among healthy oral mucosa, oral dysplastic lesions and OSCC samples (p=0.001) was noted. Extent of staining and immune reactive scores of TWEAK and Fn14 significantly increased in OSCC than oral dysplastic lesions and healthy oral mucosa. Expression of TWEAK and Fn14 showed a significant association with several clinicopathologic parameters of prognostic significance. **Conclusions:** These findings suggest that TWEAK and Fn14 might participate in the growth of OSCC. Higher expression of TWEAK and Fn14 may be an indicator of increased proliferation, altered differentiation and invasion.

Invited

Efficacy of Antiviral Drug Acyclovir on Breast Cancer Cells MCF-7 & MDA-MB- 231: A Drug Repurposing Approach

Dr. Ashish Wadhwani

Assistant Professor & Head, Dept. of Pharmaceutical Biotechnology
JSS Academy of Higher Education & Research, Ooty

Drug repositioning has been growing in importance in the last few years as an increasing number of drug development and pharmaceutical companies see their drug pipelines drying up and realize that many previously promising technologies have failed to deliver 'as advertised'. Current cancer therapy includes the use of chemotherapeutic agents, surgery and radiation therapy. It is estimated that four types of viruses [human papillomavirus (HPV), hepatitis B (HBV), hepatitis C (HCV), and Epstein–Barr virus (EBV)] alone could cause 12% of cancer cases worldwide. Investigation of the virus associated cancer serves as a unique platform for the development of novel strategies to prevent the development of infection that can predispose tumorigenesis. Studies on antiviral drug treatments demonstrate promising results on the prognosis through the prevention of carcinogenesis. This **concept triggered** the **idea** of **repurposing** the **antiviral drug acyclovir** for **breast carcinoma**.The objective of the study was to repurpose Acyclovir by evaluating its morphometric, cell cycle arrest and migratory features on the breast cancer cell lines.The cytotoxicity studies were carried out with acyclovir, cisplatine and combination of acyclovir + cisplatine. The MTT assay results indicated the promising activity of the drugs/combinations tested against MCF-7 and MDAMB-231 cell lines. The acyclovir showed IC_{50} of 3.16 ± 1.10 µg/ml and 3.85 ± 1.54 µg/ml respectively with selectivity index of 33.46 and 27.46. To confirm the ability of the single cell to grow into a colony the clonogenic assay was performed. The platting efficiency was found to be 52.30 % and the survival fraction (SF) in cells treated with drug at lowest concentration (0.25µg/ml) was 1.31 %. This indicates the potential anti-metastatic effect of the acyclovir. The advanced studies like DNA fragmentation and Cell Cycle analysis were carried out. The accumulation of cells in at G2/M phase phase is an indication of cell death by apoptosis.

Invited

An investigation into the mutational spectrum and sub-types of TNBCs in Indians; A population with high proportion of TNBCs

Dr. Aruna Korlimarla
Assistant Professor, Molecular Medicine
St. John's Research Institute, Bangalore

TNBC is a heterogeneous disease and the subtypes reported by Lehman B et al in 2014 differ in their gene expression profiles, mutational spectrum and the extent of immune infiltrates. The incidence of Breast Cancer (BC) is on the rise in Indian women and it is estimated that the current life-time risk for developing BC in urban Indian women is 1 in 22. Half of the women with a diagnosis of BC are under the age of 50, which is a decade earlier than that seen in the West, and the Age-Standardized-Ratio (ASR) is 33 per 1,00,000 population. India has the highest BC incidence-to-mortality rate in the world mainly attributed to late-stage presentation and hence, poor treatment outcomes. In addition to these important clinico-epidemiological features, a far greater proportion (>30%) of BCs in Indian women are hormone receptor (ER and PR) negative and human epidermal growth factor receptor *2 (HER2) negative* and hence, termed as Triple Negative BC (TNBC). Due to its aggressive nature and the lack of effective targeted therapies, patients with TNBC generally have a poorer prognosis (at least 10% lower disease free 5-year survival rate) *vis-à-vis* hormone positive BCs. We sequenced somatic DNA from 42 TNBCs (FFPE Specimens) on Ion Torrent PGM, from a non-consecutive retrospective case-series of close to 200 tumors from a regional cancer Center and a consecutive series of 446 tumours from two different treating centers. Our series from both, represents close to 30% of TNBC. The HotSpot Cancer panel from Thermo Fisher Scientific, comprising of 212 DNA-specific amplicons covering hotspots in 50 cancer associated genes was used to construct the libraries. Variant calling was done following ACMG and SHERLOC guidelines. Data from our series was compared to TCGA. The most frequently mutated genes were TP53 (69%), followed by IDH1 (21%), PIK3CA (19%) and EGFR (16%) indicating similarity in the biology of the disease compared to that reported in the TCGA set (N=102). At 69%, the frequency of TP53 mutations in our set was comparable with that of Caucasians (70%) and AA (73%). However, we noted a statistically significantly higher proportion of PIK3CA mutations (8/42 =19%) as compared to ~8% in TCGA set (8/102) of which, there were none in AA (0/20), (p=0.003). Lehman et al's work on TNBC subclassification revealed that the LAR subtype is enriched with PIK3CA mutations and therefore higher incidence of PIK3CA mutations in our series is a significant finding since there is evidence now to show that this LAR subgroupcan be treated with Anti-androgen agents. It is also interesting that we differ from African American ethnicity in this aspect as they have nil PIK3CA mutations as recorded by TCGA. Curiously enough, frequency of IDH1 and EGFR mutations were also high at 21% and 16% respectively which has not been earlier reported. .

Invited

Senescent cell – Cell with an alter ego

Dr. Shyamala Karnam
Reader, Dept of Oral Pathology and Microbiology,
Rajarajeswari Dental College and Hospital, Bangalore

Senescent cells, a population of cells withdrawn from cell cycle, reaching a state of irreversible growth arrest are currently gaining enormous attention in the field of cancer research. Cellular Senescence is attained when cells that can divide encounter oncogenic stresses such as telomere shortening, epigenetic de repression of the INK4a/ARF locus, and DNA damage. Senescence, in one aspect is a protective mechanism to remove damaged, harmful cells from the proliferative pool, hence thought to be playing a beneficial role as a tumor suppressor. In contrast to this, there is growing body of evidence implicating senescent cells in tumor initiation and progression by creating a pro oncogenic environment, via the secretion of Senescence associated secreto proteins (SASP). Few studies have shown that senescent cells progressively increase during the development of premalignancy but fade out when it is transformed into malignancy. Such is the behaviour of senescent cells at different stages of tumorigenesis. In this paper we discuss what is cellular senescence, what are the molecular mechanisms of cellular senescence and role of senescent cells and their secreto phenotypes in premalignancy and malignancy with special emphasis on oral cancers.

ORAL PRESENTER ABSTRACT'S

Association of single nucleotide polymorphism of interleukin-6 -174G>C gene with risk of cervical cancer among north Indian population

Pushpendra Pratap

Research Analyst, Department of Biotechnology
ERA'S Lucknow Medical College & Hospital, Lucknow

Cervical cancer (CC) is the second most common cancer and the third leading cause of cancer-related death amongst females in less developed countries. Progression and development of cervical cancer (CC) is strongly associated with chronic inflammation as well as obligatory etiological oncogenic cause, such as human papillomavirus (HPV). Interleukin-6 (IL-6) secreted by macrophages, a multifunctional cytokine which regulates inflammation and diverse physiological processes. The aim of our study is to evaluate the association along with interleukin-6 (IL-6) −174G>C gene polymorphisms and possibility of cervical cancer among Indian populations. A total number of 37 histopathologically confirmed cases of cervical cancer and 41 healthy controls were evaluated for Single nucleotide polymorphism analysis of -174G>C by Polymerase chain reaction-restriction fragment length polymorphism (PCR-RFLP) method. There were significant differences in the GC genotype and C allele frequencies of the IL-6 −174G>C gene polymorphism between cervical cancer patients and controls. The frequencies of the GG, GC and CC genotypes of IL-6 (−174G>C) were 83.78%, 13.51% and 2.70% in cases and 73.17% and 26.82% in controls, respectively. While no frequency of CC genotype were identified in controls

Combinatorial In Silico Strategy towards Identifying Potential Hotspots during Inhibition for Effective Chemotherapy against Neurological Disorders

Dr. Shabir Ahmad Ganai

Young Scientist, Department of Biotechnology
University of Kashmir, Jammu & Kashmir

Histone deacetylases (HDACs) regulate epigenetic gene expression programs by modulating chromatin architecture and are required for neuronal development. Dysregulation of HDACs and aberrant chromatin acetylation homeostasis have been implicated in various diseases ranging from cancer to neurodegenerative disorders. Histone deacetylase inhibitors (HDACi), the small molecules interfering HDACs have shown enhanced acetylation of the genome and are gaining great attention as potent drugs for treating cancer and neurodegeneration. HDAC2 overexpression has implications in decreasing dendrite spine density, synaptic plasticity and in triggering neurodegenerative signaling. Pharmacological intervention against HDAC2 though promising also targets neuroprotective HDAC1 due to high sequence identity (94%) with former in catalytic domain, culminating in debilitating off-target effects and creating hindrance in the defined intervention. This emphasizes the need of designing HDAC2-selective inhibitors to overcome these vicious effects and for escalating the therapeutic efficacy. Here we report a top-down combinatorial in silico approach for identifying the structural variants that are substantial for interactions against HDAC1 and HDAC2 enzymes. We used extra-precision (XP)-molecular docking, Molecular Mechanics Generalized Born Surface Area (MMGBSA) for predicting affinity of inhibitors against the HDAC1 and HDAC2 enzymes. Importantly, we employed a novel in silico strategy of coupling the state-of-the-art molecular dynamics simulation (MDS) to energetically-optimized structure based pharmacophores (e-Pharmacophores) method via MDS trajectory clustering for hypothesizing the e-Pharmacophore models. Further, we performed e-Pharmacophores based virtual screening against phase database containing millions of compounds. We validated the data by performing the molecular docking and MM-GBSA studies for the selected hits among the retrieved ones. Our studies attributed inhibitor potency to the ability of forming multiple interactions and infirm potency to least interactions. Moreover, our studies delineated that a single HDAC inhibitor portrays differential features against HDAC1 and HDAC2 enzymes. The high affinity and selective HDAC2 inhibitors retrieved through e-Pharmacophores based virtual screening will play a critical role in ameliorating neurodegenerative signaling without hampering the neuroprotective isoform (HDAC1).

Impact of quality of interpersonal relationship between patients and their caregiver on their Quality of life

Dr. C Vanlalhruaii
Assistant Professor, Centre for Health Psychology
University of Hyderabad, Hyderabad

The objective of this study was to understand the quality of relationship based on agreement and disagreement on the same between patients with cancer and their caregivers. And to find out the impact of quality of relationship on quality of life of patients with cancer and their caregivers. In the present study 100 pairs, that is patients with cancer (Breast Cancer & Head and Neck Cancer) and their family caregivers were included. Cancer Specific Interpersonal Relationship (Form A & Form B) were administered to both patients and caregivers, EORTC QLQ- C 30 was administered on the patients, and Caregivers Quality of Life Index- Cancer was administered on their family caregivers. The results of feature development analysis showed that disagreement between the perception of patients and their caregivers on interpersonal relationship was higher than the agreement between them in their perception of interpersonal relationship. Also the results of simple and multiple regression (stepwise) showed that patients' higher perception on interpersonal relationship predicts careigvers' quality of life and its dimensions such as disruptiveness and positive adaptation in caregivers. In conclusion, to address the disparities between patients and their caregivers in their perception of interpersonal relationship there is a need for psychological intervention. This intervention will involve counseling both for better understanding of each other's perception of interpersonal relationship; thus identifying areas where both have to put in individual and combined effort.

Gynecologic Cancer: A Literary Research for Prevention and Cancer Therapy in Unani Medicine

Dr. Arshiya Sultana
Lecturer, Dept. of Ilmul Qabalat wa Amraze Niswan,
National Institute of Unani Medicine, Bangalore

Cancer is one of the fastest growing diseases**.** Gynecologic cancer is any cancer that starts in woman's reproductive organs. Every year, more than 29, 000 die from this cancer in the United States. In *Unani* (Greco-Arab) medicine, abnormal accumulation of black bile (*sauda*) causes cancer (*sartan*). Unani scholars had paid their attention towards the prevention and treatment of cancer. In the last two decades, great advances have been made in cancer therapy; however, the success rates still remain unsatisfactory. Current conventional anticancer therapies are associated with adverse effects, drug resistance, and cancer recurrence. Therefore, the primary aim of this literary exploration was to appraise the role of Unani medicine for the prevention and palliative treatment for gynecologic cancer. An extensive bibliographic research for the prevention and palliative treatment of Gynecologic cancer has been carried out by means of reviewing the main authentic Unani texts viz., Al Qanoon fit tibb (Ibn Sina), Zakheera Kharzam Shahi (Ismail Jurjani), Tarjuma Kamilus Sana (Abul Hassan Ali Bin Abbas Majoosi), Al Hawi (Mohammed Bin Zakariya Razi) and other texts of various gynecological disorders. Further, scientific engines and databases like Google scholar, PubMed, Science direct, AYUSH portal, Scopus and Ovid were also explored. Ibn Sina, Ismail Jurjani, Majoosi, Razi and Kabiruddin have discussed regarding gynecologic cancer causes, symptoms, prevention and palliative treatment. Al-Razi and Ibn Sina recommended 131 and 55 plants for the cure of cancer respectively. Al-Razi and Ibn Sina highlighted plant parts used and important properties of the drug. Recent studies explained that anticancer activity is the effect of natural and synthetic or biological and chemical agents to reverse, suppress or prevent carcinogenic progression. Medicinal herbs are being increasingly accepted as useful complementary treatments for cancer due to the presence of antioxidants in them. Moreover, many clinical studies have concluded the useful effects of herbal medicines on the immune modulation, survival, and quality of life (QOL) of cancer patients, when these herbal medicines are used in combination with conventional therapeutics.

Oral cancer : A Review

Dr. Imaan Shakil Ahmed Rumani

DNB General Surgery Resident
Miraj Wanless hospital, Miraj.

Oral cancer is one of the serious and rapidly growing life threatening cancer in many parts of the world. Approximately 60,000 new cases are reported every year in India. The prevalence of oral cancer is on a rise and is one of the growing cause of increasing morality and morbidity.Oral cancer is a multifactorial disease, however the principal aetiological agents are tobacco and alcohol. Early detection of oral cancer is a continuing goal as it can be prevented by the intervention of risk factors.The majority of oral cancers are not preceded by any obvious premalignant lesson however there are a group of pathological conditions in which an association with malignant transformation exists of which Erythroplakia, proliferative verrucous leukoplakia and chronic hyperplastic candidiasis carry the maximum risk. Oral cancer is more prevalent in men, also more prevalent in older age groups. The most common sites are the tongue, floor of the mouth and the lower lip.Squamous cell carcinoma is the predominant histology for tumors arising in the oral cavity and the spread of tumor from the primary is mainly through lymphatics involving level one and two, less likely to level three.The staging of oral cancer is defined by AJCC and follows the TNM system.Information obtained from clinical examination and imaging are used to assign a clinical stage, which is then used to stratify patients for selection of the modality of treatment and report the results of treatment alternatives.This review focuses on the critical aspects of this cancer with priority given to squamous cell carcinoma including in total about oral cancer.

Invitro Cytotoxic and Apoptotic Induction effect of Earthworm Coelomic Fluid on Oral Squamous cell carcinoma cells

Dr. Dominic Augustine

Department of Oral and Maxillofacial Pathology,
Ramaiah University of Applied Sciences, Bangalore

The Objective are: 1. To estimate the anti-proliferative/cytotoxic effect of earthworm coelomic fluid of *Eudrilus eugeniae (EE), Eisenia fetida (EF)* and *Perionyx excavatus (PE)* on oral cancer cell lines. 2. To ascertain the stages of cell cycle arrest and cellular damage caused by earthworm coelomic fluid on oral cancer cell lines. 3. To study the mechanism of cell death caused by earthworm coelomic fluid on oral cancer cell lines through PCR.

The cold shock method was employed for coelomic fluid collection. The MTT assay was performed to determine the inhibitory effects of test compounds on cell growth *in vitro* using SCC-9 cell line from ATCC (American Type Culture Collection). The minimum inhibitory concentration (IC_{50}) was obtained. The cytotoxic tests performed were Lactate dehydrogenase assay, Comet assay and Clonogenic assay. Cell cycle analysis was performed using FACS Caliber flowcytometry to determine the stage of cell cycle arrest. Annexin V FITC/PI (Fluorescein isothiocyanate/Propidium Iodide) Apoptosis Assay was performed to ascertain the apoptotic rate. AO/EB (Acridine Orange/Ethidium Bromide) staining was performed to view the apoptotic cells under fluorescent microscope. Apoptotic pathways caspase 3 and 8 were evaluated through RT-PCR (Reverse Transcriptase polymerase chain reaction). ECF of EE, EF and PE showed an antiproliferative potential on SCC -9 cells with IC_{50} values 4.6, 5.27 and 44.69 µg/ml for EE, PE and EF respectively. The SCC – 9 cells treated with different concentrations of samples EE, EF and PE showed increased LDH activity at higher concentrations compared to untreated cells. An increased DNA strand breaks and cytotoxicity compared to untreated cells was observed in Comet assay. Clonogenic assay revealed significant inhibition of colony forming capability compared to the control. Effective cell cycle arrest was seen at G2M phase following flowcytometry analysis. Significant induction of apoptosis was observed following the performance of Annexin V FITC Apoptosis assay. AO/EB staining revealed apoptotic changes in SCC-9 cell line. An upregulation of caspase 3 and 8 was observed through RT PCR.

A study on the prescription pattern of ophthalmic infections in a tertiary care teaching hospital of Assam

Dr. Luna Kuli
Department of Pharmacology,
Assam Medical College and Hospital,Assam

To study the prescription pattern of ophthalmic infections in a tertiary care teaching hospital and to assess the rationality of drug use. This study was conducted at the Department of Ophthalmology, Assam Medical College and Hospital, Dibrugarh, Assam. Study period: A retrospective study was carried out for a period of two months from 1/01/2018 to 28/02/2018. Retrospective study. Sample size: A total of 308 prescriptions were evaluated. Inclusion criteria: Prescriptions of patients of either sex and all ages were included. Exclusion criteria: Prescription of patients with concomitant diseases like diabetes, hypertension or other diseases were excluded (Suman RK et al, 2015). 1) A total of 308 prescriptions were assessed. 2) The commonest ocular infection was bacterial conjunctivitis. 3) The male : female ratio was 1.40. 4) Age-wise distribution of disease is < 1 yr was 16 (5.19%), 1 – 10 yrs was 22 (7.14%), 11 – 20 yrs was 32 (10.38%), 21 – 30 yrs was 76 (24.67%) , 31 – 40 yrs was 60 (19.48%), 41 – 50 yrs was 60(19.48%), 51 – 60 yrs was 22 (7.14%), 61 – 70 yrs was 12(3.89%), > 70yrs was 8 (2.59%). 5) Disease statistics are bacterial conjunctivitis was 120 (38.96%), dacrocystitis was 56 (19.31%), chalazion was 36 (11.68%), blepharitis was 26 (8.44%), corneal ulcer was 24 (7.79%), stye/external hordeolum was 16 (5.19%), viral conjunctivitis was 14 (4.54%), viral keratitis was 12 (3.89%) and pre-septal cellulitis was 4 (1.29%). 6) A total of 684 drugs were prescribed. The average number of drugs per prescription was 2.22. Out of 684 drugs, antimicrobials were 458 (66.95%), artificial tear substitutes were 160 (23.39%), cycloplegics were 16 (2.33%),NSAIDS were 50 (7.30%) were prescribed respectively. 7) Drugs administered 624 (91.22%) were topical, 60 (8.77%) were oral, zero (0%) were injectables and 6 (0.8%) were fixed dose combinations. 8) 346 were prescribed from Essential Drug List of Assam 2016 (EDL Assam 2016), 560 (81.87%) drugs were prescribed from National List of Essential Medicines 2015 (NLEM 2015), zero brand names were used. 9) No polypharmacy were found in the prescriptions. The demographic details of the patient such as name, age, sex, address, chief complaints, findings, diagnosis, Rx symbol, doctor's signature were present in all prescriptions

Removal of medicinally valuable dairy proteins by a low cost unit operation from dairy waste water

Dr. Prabir Kumar Datta
Associate Professor, Department of Pharmaceutical Engineering
Bengal College of Pharmaceutical Sciences & Research , Durgapur

Foam Fractionation, a low cost unit operation is the foaming branch of Adsorptive Separation Method developed by Robert Lemlich (1966) and sent to I.U.P.A.C committee in1967. The principle is based on physical or chemical adsorption of surface active molecules on the bubble's surface. The adsorbed quantity can be quantitatively expressed by Gibb's Equation of adsorption isotherm. The recovery, isolation and purification of bio molecules like medicinal proteins in pharmaceutical production plant requires sufficient effort at the production point of downstream processing due to presence of desired product in low concentration found particularly true in pharmaceutical biotechnology. 27 experiments were conducted taking 1,000 ml of dairy waste water as feed in each experiment and optimised responses was recorded at operating variables such as pH=5 ,GFR=350ml/min , initial concentration=500 mcg/ml, temperature =25±2 degree centigrade , run time of foam column operation=55minutes , ionic concentraion in feed (μ=0.1Mol/L of NaCl), protein surfactant ratio (PSR)=1.5:1(w/w) and optimised responses were found such as enrichment ratio(Er)=49 ,separation ratio(Sr)= 465.74 ,heat of desorption (λ)=3360 Cal/mol ,rate of removal(Rv)= 8.05 ml/min , percent recovery (Rp%) = 98.45% and time for 50% removal (t50 %)=33.61 min. All these data were calculated from experimental table and calculations were done from from the equqtion of standard curve of absorbance vs concentration Material balance(material in feed =material adsorbed in foam + residue in solution) was calculated and verified for each experiment along with respective graphs (LemlichR,1972). At the above stated operating conditions, acidic proteins (pI= isoelectric point<7) were adsorbed on the bubbles surface due to hydrophobic adsorption at their isoelectric pH (around 5). The basic protein fraction(Lactoferrin-Lactoperoxidase ,pI= 9) at pH=5 being positive in nature will form hydrophobic complex and adsorbed on the bubbles surface adsorbed by counter ionic (coulombic) electrostatic attraction with negatively charged anionic surfactant Sodium Dodecyl Sulphate(SDS) at

Identification of novel drug targets in Candida albicans by In-Silico approach for strengthening antifungal drug discovery

Anubhuti Jha

Department of Biotechology
National Institute of Technology, Raipur

Systemic candidiasis is one of the most common nosocomial systemic infections causing high mortality and morbidity. Although infections caused by other *Candida* species are increasing but the majority of candidiasis is commonly caused by *Candida albicans* which accounts for 40-60% of the reported cases. Existing antifungal treatment regime is feeble due to persistent multiple drug resistance. The current drug targets are limited and there is an ardent need for novel drug targets for novel drug compounds. So, finding novel drug targets that replace the generic ones is extremely crucial. Hence, the study was designed for the identification and qualitative characterization of potential drug targets by using the subtractive proteome analysis. Different computational softwares and servers were used to identify essential proteins those are required for the survival of the pathogen. Total proteome (6035 proteins) of C. albicans was retrieved from NCBI and further shortlisted by subtractive channel analysis. The analysis revealed that few proteins were non-homologous to human where as some of the proteins were essential metabolic proteins and so on. This information was used for shortlisting and identification of drug targets. We have also found that 11 drug targets are involved in unique pathway. Most of these proteins are cytoplasmic, can be used as broad spectrum drug targets, with putative druggable properties.

Accelerated stability testing of a topical formulation for protection from ultraviolet radiation in high altitude glacial areas

Nilutpal Sharma Bora

Division of Pharmaceutical Technology,
Defence Research Laboratory, Tezpur

The present study assessed the stability potential of combinational sunscreen composed of a combination of US FDA approved ultraviolet (UV) filters and melatonin meant for prophylactic utility against UV radiation exposure in high altitude glacial areas. The drug combinations were fabricated in an oil-in-water emulsion system to yield a highly aesthetic and compliable sunscreen cream. Stability testing of the optimized formulation was established for upto 12 months under accelerated study conditions as per ICH Harmonised Tripartite Guideline for Stability Testing of New Drug Substances and Products Q1A (R2). Results obtained after 6 and 12 months showed that the optimized susncreen formulation was stable with respect to drugs content, homogenecity, pH, viscosity, zetapotential, visual inspection, and other analytical parameters.

Cell radiation or bio radiation and cancer

Inder Mohan Singh Manchanda

An Attempt Has Been Made To Explain This By My Self, In This Article That What Is The Importance Of Radiation In Our Lives.It Is True That Radiation Is Originally Connected With The Origin Of The Creation And Development Created By Radiation.Humankind is a small form of creation, and it contains the elements and qualities of creation. That is. the elements from which the creation is created or which are in the universe are also in our body. So we are no different from creation. And the creation is not separate from us. We can also say that we are only a part of the universe. Continues Waves released from the human body. Those who can be called electricity or magnetism waves, in this way it is decided that every time the process of radiation in the human body continues. And radiation releases from the human body.

A Study on Promoter Region CpG Island Hypermethylation of p16 and MGMT Gene Associated with Oral Squamous Cell Carcinoma (OSCC) in North Karnataka Population

Bhushan B. Kulkarni
Department of Biotechnology
P. C. Jabin Science College, Bangalore

Oral cancer (OC) is multifactorial disease and has become the one of the main cause for mortality and morbidity worldwide. Oral cancer is the most frequent cancer of head and neck region, with squamous cell carcinoma being the common carcinoma, accounting for about 90% of all malignancies of the oral cavity. OC is more prevalent in males than in females. India happens to be the world capital for the incidence of OC in both the sexes. Lip and oral cavity cancer is the third most common cancer in India with respect to incidence and mortality rate. Due to its high mortality and low cure rate, oral squamous cell carcinoma (OSCC) represents a major public health problem, with a great individual and socioeconomic impact. Epigenetic studies may provide better understanding of progression and development of OSCC. Epigenetic modifications are potentially reversible and transient, epigenomics based diagnostic tools are an exciting development for early cancer detection. Under this backdrop the current study was done to study on promoter region CpG island Hypermethylation of p16 and MGMT gene associated with OSCC in North Karnataka population. In a current study, 36 tissue samples of OSCC cases and 20 matched controls were collected from the associated hospitals. DNA was isolated and subjected to bisulfite modification, using Methylation specific PCR to know the status of promoter region CpG island Hypermethylation of p16 and MGMT gene. Of 36 OSCC cases, 24 (66.66%) cases showed positive for promoter region CpG island methylation of p16 gene and 20 (55.55%) cases showed positive for promoter region CpG island methylation of MGMT gene. None of the matched healthy controls showed positive for promoter region CpG island methylation of p16 or MGMT gene. Further significant association was found between the methylation of p16 and MGMT genes with respect to advancing age, advanced stage and with anatomical sites (buccal cavity).

Comparative Analysis of Effects of Pithecellobium dulce Bark and Glibenclamide on Genetic expressionof antioxidant enzyme markers in Alloxan induced Diabetic Swiss Albino Male Mice

Swaati Sharma
Department of Bioscience and Biotechnology
Banasthali Vidyapith, Rajasthan

Oxidative stress and the gene expression at the transcriptional level of antioxidant enzymes were investigated in alloxan induced diabetic mice. The mRNA expression of antioxidant enzymes, superoxide dismutase 1 (SOD-1), glutathione peroxidase 1 (GPx1), catalase (CAT) and GSR in liver and kidney were quantified using a real-time polymerase chain reaction (qPCR). We used *Pithecellobium dulce* bark (PDB) treated mice as a model of diabetes experimental drug treated group, Glibenclamide treated (GT) mice as positive control, alloxan- induced diabetic mice as a model of diabetic control (DC), whereas non- alloxan treated mice were used as the normal control (NC). The internal housekeeping gene was used as G3PDH, while the calibrator selected for the study was normal, untreated kidney. The PDB treated mice demonstrated moderate hyperglycemia as compared to glibenclamide treated mice and the alloxan treated diabetic control mice showed severe hyperglycemia. From the above results, it can be clearly noticed that PDB was found most potent then glibenclamide in regulating the SOD, GPx, CAT and GSR enzyme marker gene and upregulation of these enzymes by PDB treatment regulates renal damage and DNA damage caused by diabetes induced oxidative stress in both kidney and liver tissues.

Study on the anti-emetic property of methanolic extract from stems of *swertia chirata* using chick emesis model.

Medhi Pranjal Kumar

Department of Pharmacology,
Assam Medical College & Hospital,.Dibrugarh

To study the anti-emetic property of the methanolic extract from the stems of *Swertia chirata* using chick emesis model. The study was conducted in the department of pharmacology, Assam Medical College, Dibrugarh during the period from 15.11.2017 to 16.02.2018. The study was carried out after getting proper approval from the Institutional Animal Ethics Committee (IAEC). Methanolic extract of *Swertia chirata* was prepared by Soxhlet apparatus. Acute toxicity test was done according to the OECD-425 guidelines. 25 nos. of young male chicks of four days old weighing 25 to 35 gms were used for the investigation. The chicks were grouped into 5 with each group bearing 5 chicks (n=5). Group I (CONTROL) received normal saline 10ml/kg b.w. Group II (STANDARD) received chlorpromazine 150 mg/kg b.w. Group III (EXPERIMENTAL-1), Group IV (EXPERIMENTAL-2) and Group V (EXPERIMENTAL-3) received the extract at doses of 50,100 and 150 mg/kg b.w repectively. Chlorpromazine and the extract were prepared as solutions in 0.9% saline containing 5% DMSO and 1% Tween 80. All drugs were injected intraperitoneally at the volume of 10ml/kg body weight in doses as mentioned here. After injection, we waited for 10 minutes and each group was fed copper sulfate anhydride orally at the dose of 50mg/kg body weight. Preliminary phytochemical screening of the extract revealed the presence of alkaloids, glycosides, flavonoids, triterpenes and diterpenes, while there was absence of tannins, saponins and phenols. All the three doses of the extract showed anti-emetic activity. The dose of 50 mg/kg b.w showed activity comparable to chlorpromazine, while dose of 100 mg/kg b.w and 150 mg/kg. b.w showed highly significant ($P < 0.001$) and greater activity than chlorpromazine. Highest anti-emetic activity (79.26% inhibition) was shown by dose of 150mg/kg b.w and lowest (42.22% inhibition) by dose of 50mg/kg b.w

Drugs, granulosa cells and oocyte survival

Meenakshi Tiwari

Department of Zoology
Institute of Science, BHU, Varanasi

Oocyte handling under in vitro culture conditions may be adversely affected by minor changes in various physical factors including temperature, osmolarity, pH and culture medium. These minor changes could induced the generation of reactive oxygen species (ROS). A possibility exist that the handling of denuded oocytes under in vitro culture conditions could generate ROS and deteriorate oocyte quality by inducing apoptosis during various assisted reproductive technologies (ARTs). Use of various drugs and handling of cumulus enclosed oocytes instead of denuded oocytes could protect oocytes from oxidative stress (OS) damage due to in vitro culture conditions. Granulosa cells closely interact and provide support to the maturing oocyte, shares the oocyte microenvironment and minimize damage cause due to high level of ROS. Since the oocyte is source of the genetic information to be passed down from generation to generation, the quality of mature oocytes (meiotic competence) is crucial for fertilization and successful propagation of species. In vitro studies using a gap junction blocker, arbenoxolone (CBX) suggest that a known gap junction blocker interrupts transfer of cyclic nucleotides to the oocyte and results meiotic exit from diplotene arrest in vitro. Further, nitric oxide (NO) donor, S-nitroso-N-acetyl penicillamine (SNAP) and aminoguanidine (AG) reduce intraoocyte NO level result in spontaneous meiotic exit from diplotene arrest in vitro. Although hCG induced generation of ROS is sufficient to trigger the achievement of meiotic competency but not good enough to induce oocyte apoptosis in vivo. The exogenous supplementation of hydrogen peroxide (H_2O_2) increases intraoocyte level of ROS, causes OS and triggers oocyte apoptosis. However, presence of encircling granulosa cells protected ROS-mediated oocyte apoptosis and maintained its survivability under in vitro culture conditions.

Expression and characterization of dengue NS1 for development of field deployable Dengue virus detection system from vector mosquitoes

Bidisha Das

Entomology and Biothreat Management
Defence Research Laboratory, Tezpur.

Flavivirus Non-structural1 (NS1) protein, is one of the most preferred targets for the development of immune-based diagnostics. Detection of dengue NS1 antigen is an important diagnostic biomarker during acute phase of infection. Different expression systems and strategies have been employed for recombinant NS1 protein production. Its use as an early diagnostic system has been acknowledged by researchers worldwide. With the approach of using NS1 antigen for early diagnostic, our aim is to develop a rapid, field deployable dengue virus detection system from mosquitoes, which could benefit if incorporated into the routine of dengue control program. Here the NS1 antigen was expressed in E.Coli by using appropriate vector and suitable culture conditions to maximize protein production. The gene encoding NS1 was codon optimized for E.Coli and engineered to carry 6× Histidine tags at both N and C-terminal ends. It was synthesized and cloned into pUC57. Polymerase chain reaction was optimized with in-house designed, restriction sites incorporated, oligo primers. The amplicon was purified and cloned into pET 32c(+) expression system and validated by colony PCR and RFLP analysis. Sequencing of the construct was done to further confirm the in-frame cloning of the gene. The recombinant construct (pETNS1) was expressed with IPTG maintaining different optimized parameters viz IPTG concentration, media type, temperature, and harvest time. The size of the expressed protein was ascertained through SDS-PAGE and was found to be ~65 kDa. The authenticity of the expressed protein was confirmed through Western Blotting using anti-His HRP conjugates. The NS1 protein was purified under denaturing conditions. Antibody raised against the protein will be used for development of dengue detection kit in mosquitoes.

Design, synthesis and evaluation of novel bis-arylsulfonamides as activators of TRPV4 calcium channels in breast cancer cells.

Jeevak Sopanrao Kapure

School of Pharmacy
The University of Queensland, Australia

Basal breast cancers are associated with poor prognosis, and most do not express the estrogen receptor, the progesterone receptor and human epidermal growth factor receptor 2 (HER2), which makes them refractory to treatment with hormonal therapy and HER2 targeted monoclonal antibody therapy. Traditional chemotherapy remains the standard treatment for most basal breast cancers, hence there is an urgent need to develop new targeted therapies. Transient receptor potential vanilloid 4 (TRPV4) calcium channels are overexpressed in a subset of basal breast cancer cells, making pharmacological modulation of TRPV4 a prospective therapeutic approach for some basal breast cancers. Recently it was shown that pharmacological activation of the Ca^{2+} permeable ion channel TRPV4 in basal breast cancer cells with pronounced endogenous overexpression of TRPV4, produces cell death by oncosis and apoptosis. Furthermore, pharmacological activation of TRPV4 reduces basal breast cancer tumour cell growth *in vivo.* Herein we report the design, synthesis and evaluation of novel bis-arylsulfonamides targeting TRPV4 in MDA-MB-468 human breast cancer cells, which endogenously overexpress TRPV4. A series of 18 novel bis-arylsulfonamides (Figure 1) were designed and synthesized based on the structure of GSK-1016790A, which is a potent selective TRPV4 activator. An efficient strategy was developed for synthesis of the compounds involving a 3- to 4-step synthetic route with overall moderate-to-good yields. Intracellular free calcium levels in MDA-MB-468 cells in response to the synthesized compounds were assessed using a fluorescent imaging plate reader (Molecular Devices FLIPR^{TETRA}). The novel bis-arylsulfonamides were found to activate TRPV4 calcium channels, with the most potent compound having an EC_{50} = 6.5 µM, superior to the known TRPV4 activator RN-1747 (EC_{50} = 21 µM). Further development of bis-arylsulfonamides to obtain compounds with greater potency is currently in progress.

Importance of Okra Mucilage in Drug Development

Soma Das
Department of Pharmaceutical Technology
Jadavpur University, Kolkata

To isolate the mucilage from the okra (lady's finger) fruit and analyse the phytoconstituents quantitatively. Methanolic(MeOH) and ethanolic(EtOH) mucilage extract isolation from the fruit of okra was done. Identification test was performed. Presence of flavanoid was quantitatively determined by High Performance Liquid Chromatography. Chromatographic separations were achieved using column C18 xtera 4.6x250mm. A reverse phase HPLC assay was carried out using an isocratic elution with a flow rate of 1.0 ml/minutes, a column temperature of 35°C, a mobile phase of 1% acetic acid and methanol and a detection wavelength of 356 nm using PDA detector. The injection volume was 20 µL / min. The total run time was 15minutes for each injection. The total polyphenol content was determined quantitatively using Folin Denis reagent, with tannic acid as the standard at 760 nm. Identification test by ruthenium red solution confirms the presence of mucilage. The total percentage of flavanoid was found to be 0.42%w/w and 0.063% w/w in the Okra MeOH and Okra EtOH extract respectively. Content of total polyphenol for Okra MeOH and Okra EtOH extract was found to be 4.6 % w/w and 5.3 %w/w respectively.

MedPServer – target discovery of natural products, elucidation of their therapeutic mechanism, and natural product-based lead identifications

Dr. P. Angamba Meetei
Assistant Professor, Dept. Of Biotechnology
Manipur University, Manipur

Natural products have been the source of treatment for various human diseases from time immemorial. Interests in natural product based scaffolds for the discovery of modern drugs has grown in recent years. In contrast, the research on exploring the traditional medicinal systems for modern therapeutics is severely limited due to the incomplete understanding of the therapeutic mechanism of action. One possible solution is to develop computational approaches based on ligand- and structure-based screening tools for fast and plausible target identification, leading to elucidation of the therapeutic mechanism. In the present work, we present two methods based on shape-based and pharmacophore search to predict the targets and elucidate therapeutic mechanism, and to identify natural product-based leads. These methods at present were tested on an in-house developed database of medicinal plants that include information from a largely unexplored North Eastern (NE) region of India, known as one of the twelve mega biodiversity regions. However, any existing databases can be used for screening using the methods depending upon the choice of the lead molecules.

Comparison of salivary alkaline phosphatase (A-ALP) levels in tobacco users & non users to determine its role in diagnosing potentially malignant oral disorders (PMOD)

Dr. T. R. Menaka

Department of Oral and Maxillofacial Pathology
Adhiparasakthi Dental College & Hospital, Tamilnadu

The Objective are: **1.** To determine the levels of S-ALP in tobacco users, healthy volunteers and individuals with oral lesions.**2.** To compare the levels of S-ALP in tobacco users and healthy volunteers **3.** To compare the values of S-ALP among the individuals who have developed oral lesions (PMOD) and those without oral lesion
The study population consists of 40 participants (aged between 18 and 75 years) divided into 4 groups. 30 individuals with cigarette/bidi smoking or chewing tobacco for a minimum period of 6 months. 10 age and sex matched healthy volunteers to serve as control. Individuals who were diagnosed with periodontitis clinically based on probing depth, bleeding gums and radiographical bone loss and individuals with systemic diseases/conditions such as Diabetes, renal failures and liver cirrhosis were excluded from the study. Study population were grouped as follows:Group I- Individuals who do not have the habit of smoking or chewing tobacco and without lesion on intraoral examination (n=10). Group II –Individuals who have the habit of chewing tobacco and without lesion on intraoral examination (n=10)Group III - Individuals who have the habit of smoking and without lesion on intraoral examination. (n=10)Group IV – Individuals having lesion on intraoral examination with/without the habit of smoking/ chewing tobacco (n=10). The data obtained will be subjected to statistical analysis for comparison between the groups.

Nifedipine and KN-93 could be used to prevent a problem of spontaneous egg activation during postovulatory egg aging

Karuppanan V Premkumar

Department of Zoology
Banaras Hindu University, Varanasi

Calcium plays a major role in regulating oocyte physiology and affects its quality post ovulation. Recent reports from our laboratory suggest that the insufficient increase of cytosolic free Ca2+ level mediates spontaneous egg activation (SEA) in rat. However, it remains unclear whether L-type and or RyR calcium channels are involved in the increase of cytosolic free Ca2+ level and whether this increase induces cyclin B1 degradation via CaM-dependent Kinase-II (CaMK-II). To test this possibility, aged ovulated eggs collected after 17 h post-hCG surge that were arrested at M-II stage were cultured with or without various concentrations of nifedipine, ruthenium red, caffeine and KN-93 for 3 h. The morphological changes characteristics of SEA, cytosolic free Ca2+ level, cyclin B1 level and meiotic status were analysed. Nifedipine, a L-type calcium channel blockerinhibited SEA in a dose-dependent manner. Further, ruthenium red, a RyR calcium channel blocker significantly reduced cytosolic free Ca2+ level and protected against caffeine mediated increase of cytosolic free Ca2+ level. On the other hand, KN-93, a selective inhibitor of CaMK-II introverted SEA in a concentration-dependent manner. A significant reduction of cyclin B1 level was associated with SEA during postovulatory egg aging. These data suggest that L-type calcium channels as well as RyR channels are involved in the increase of cytosolic free Ca2+ level during SEA and the increase of cytosolic free Ca2+ level triggers cyclin B1 degradation possibly due to increased CaMK-II activity. The decrease in the level of cyclin B1 triggers SEA in aging eggs. Thus, nifedipine and KN-93 could be used to prevent SEA during in vitro handling of eggs for various assisted reproductive technology (ART) programs.

Exosomal PTEN – a probable predictor for survival in Gliomas

Sreekanth Patnam
Cell & Molecular biology Research Center
Apollo Health Educational and Research Foundation, Hyderabad

Malignant glioma is the most common primary brain tumor in adults, but the prognosis for patients with these tumors remains poor despite advances in diagnosis and standard therapies such as surgery, radiation therapy, and chemotherapy. Progress in the treatment of gliomas largely depends on an increased understanding of the biology of these tumors. Phosphatase and tensin homolog deleted on chromosome 10 (PTEN), a tumor suppressor protein normally localized in the cytoplasm and nucleus is the most important negative regulator of the PI3K signaling pathway.Loss of PTEN function by mutation or LOH correlates with poor survival in anaplastic astrocytoma and glioblastoma, suggesting that PTEN plays a role in patient outcome. The ability to detect favorable survival in glioma patients non-invasively would be of substantial clinical value. Paired tissue and exosome samples were collected from glioma patients. Serum exosome isolation were isolated by Total Exosome isolation kit (Invitrogen).The exosomes were characterized by NTA, TEM (Transmission electron microscopy), Exosome Flowcytometry.123 glioma tumor patients were analyzed for PTEN expression by semi quantitative and quantitative PCR, both in tissue biopsy and paired serum exosome fractions. We assessed for any mutational differences between PTEN sequence in both tissue and serum exosomes. PTEN could be detected in serum exosomes of glioma patients. Tissue PTEN is undetectable in 10% of the brain tumor patients.Exosomal PTEN could be detected in 17% (21/123) of the total glioma samples. Exosomal PTEN could be detected in increased frequencies in lower grade brain tumors. The tumor anatomical location did not significantly hampered the exosomal PTEN detection rate. Presence of exosomal PTEN correlated with improved survival. We could detect variation between exosomal and tissue PTEN transcripts.

Downregulation of LIFR gene in Indian breast cancer patients

Real Sumayya Abdul Sattar
Department of Biosciences,
Jamia Millia Islamia, India

Leukemia inhibitory factor receptor (LIFR), a reported metastatic suppressor of breast cancer was found to be downregulated in various human cancers. The present study was designed to analyze the status of LIFR gene in Indian breast cancer patients. Ethical approval for the study was obtained from Institutional Ethics Committee of All India Institute of Medical Sciences (AIIMS), New Delhi and Jamia Millia Islamia, New Delhi. Written informed consent was obtained from all the study participants. The present study comprised of a total 86 breast cancer tissues and 86 adjacent normal breast tissue samples from Indian female sporadic breast cancer patients and were examined for LIFR mRNA expression by quantitative RT-PCR (qPCR). Various clinicopathological parameters were statistically correlated with the molecular findings. LIFR was found to be downregulated in 67.4% (58/86) cases of breast cancer. 67.4% cases showing downregulation were 1.19E1 ± 1.51E1 fold downregulated, and LIFR mRNA expression in tumor tissue was 3.31E0 ± 1.27E1 and adjacent normal breast tissue was 2.37E0 ± 8.68E0 (p = 0.039). LIFR expression showed statistically significant correlation with clinical stages of breast cancer (p = 0.011). Further analysis revealed that 46 out of 58 downregulated cases (79.31%) belonged to more aggressive stages of breast cancer.

Information needs of caregivers in cancercare

Swarajya Kopparty
Centre for Health Psychology
University of Hyderabad

The present work was aimed at finding out the expanse of information needs of the caregivers of cancer patients through qualitative approach. The sample consisted of twenty five caregivers of patients going through treatment for various types of cancers including breast cancer, head and neck cancer, blood cancer, cervical cancer and lung cancer at a cancer hospital in Hyderabad, India. The data was obtained using qualitative interviews based on interview guide. The participants were asked for informed consent followed by recording of their interview and debriefing. Analysis was done by using thematic analysis. Each interview was transcribed and reread to assign codes. Further, themes and subthemes were evolved based on the codes. Various themes were evolved where the main concerns of the participants were related to patient's personal care, emotional health, managing finances, time of caring etc. The study brings to the light pressing need of addressing the concerns of caregivers also and recognizing them as important stakeholders in the healthcare paradigm.

The green synthesis of functionalised 3-aminochromones and its biological evaluations

Nithya Murugesh
Department of Chemistry
National Institute of Technology, Tiruchirappalli

An efficient synthesis of 3-aminochromones[1] and 3-alkylchromones[2] via intramolecular hydroacylation reaction of corresponding salicyaldehyde derived nitrile and activated alkynes respectively using N-heterocyclic carbene (NHC) catalyst in ionic liquid under microwave condition is reported. This protocol has the rewards of environmental friendliness, higher yields, shorter reaction times, and convenient operation from commercially available thiazolium catalyst. Some of the derivatives of 3-amino chromones are subjected to amine functionalization in one-pot to obtain library of compounds for anticancer activity.[3] From which compounds 2c (SVM-2), 4c (SVM-4) and 2d (SVM-9) show IC50 values of 5.18 ÂµM, 4.89 ÂµM and 27.3 ÂµM respectively in HeLa S3 cells. Compound 5c (SVM-5) shows IC50 values of 13.3 and 14.2 ÂµM for A549 and HeLa S3 cells respectively. Compounds 2c (SVM-2) and 4c (SVM-4) produced morphological changes in HeLa S3 cells, which indicates that these small molecules are potential candidates for anticancer activities

Investigation of substituent effect on dna binding and *in vitro* anticancer activity through apoptosis by palladium(ii) complexes bearing heterocyclic thiosemicarbazones

Nithya Balakrishnan
Department of Chemistry
National Institute of Technology, Tiruchirappalli

A series of palladium(II) *bis*(thiosemicarbazones) complexes, $[Pd(L)_2]$ (**1**-**5**) [L = bidentate indole based thiosemicarbazone ligand] have been synthesized and characterized using analytical analysis and various spectroscopic tools such as UV-Visible, FT-IR, ^{1}H, ^{13}C and mass [Haribabu *et al.* 2018]. The exact molecular structures of the complexes (**3** and **5**) were determined by single crystal X-ray diffraction method. Spectroscopic and crystallography studies revealed that thiosemicarbazones were coordinated to Pd(II) ion as monobasic bidentate fashion to form a two five membered rings. The calf thymus (CT DNA) binding properties of the complexes (**1**-**5)** have been investigated by absorption spectroscopic titrations and viscosity measurement, which revealed the complexes could interact with CT DNA through intercalation [Tysoe *et al*. 1993, Jeyalakshmi *et al*. 2015]. In addition, *in vitro* cytotoxicity of the complexes was screened for two cancer cell lines such as PANC-1 and HeLa and also toxicity of the complexes were studied against Vero normal cell line. The complexes **4** and **5** displayed significant activity towards PANC-1 and HeLa cancer cell lines and results were also compared with well known anticancer drugs. Beneficially, all the complexes showed less toxicity against normal cells. Further, the results of AO-EB and Hoechst studies clearly indicated that the complexes induced cell death through apoptosis pathway [Stander *et al.* 2009]. The results of the present study thus highlight the strong promise for the development of highly active palladium(II) complexes as anticancer agents in medicine after further biological evaluation.

Chemopreventive effect of 5,7-dimethoxy flavone on 1, 2 dimethylhydrazine(dmh)/dextran sodium sulphate(dss)-induced colitis associated colorectal cancer(cac) by regulating antioxidant and inflammatory mediators in mice

R.Vijayabharathi
Department of Biochemistry
University of Madras, Madras

Colorectal cancer (CRC) is the third most common malignancy and remains as the major cause of cancer-related death, worldwide. Inflammatory bowel diseases (IBD), such as ulcerative colitis (UC) and Crohn's disease (CD) elevate the risk of CRC which remains a life-threatening complication. The main objective of this study was to evaluate the antioxidant, anti-inflammatory and chemopreventive efficacy of 5,7-dimethoxy flavone on 1,2-D imethylhydrazine (DMH)/Dextran sodium sulfate (DSS) induced colitis associated colon carcinogenesis in Balb/c mice. Four groups of male Balb/c mice, with six animals in each group, were taken. Group-1 served as control, Group-2 animals were treated with DMF in sterile water (30 mg DMF/kg.b.wt, Orally), 3 times weekly, Group-3 animals were induced with DMH,20mg/kg body wt *(i.p),* single injection, 1 week before 3 cycles of 3% DSS in drinking water.(One DSS cycle : 3% DSS in water for 7 days followed by 14 days of sterile water). Group-4 animals were induced with DMH/DSS as in group-3 and co treated with 30 mg DMF/kg.b.wt, orally, 3 times weekly. At the end of the experimental period, the animals were sacrificed and the colon tissue samples were collected for further analysis. In the colon tissue samples, lipid peroxidation, antioxidant status and inflammatory markers were determined. The histological findings of group-3 (induced) animals showed colon damage and inflammatory cell infiltration and increased collagen deposition. In this study the group-4 animals co-treated with 5,7-DMF significantly increased the activities of the, antioxidant enzymes such as superoxide dismutase (SOD) and catalase (CAT) and decreased the levels of inflammatory markers like NF- κB, COX-2 and IL-1β. In addition to this, 5,7 DMF down regulated the expression of MMP-2, MMP-9, which favour tumour metastasis, and VEGF, which is responsible for tumour angiogenesis. Taken together, this study suggested that co-treatment with 5,7-DMF significantly reversed the carcinogenic effect of DMH/DSS induced CAC by potentially acting as an antioxidant and anti-inflammatory agent, thus making 5,7-DMF an effective therapeutic agent for CRC.

Small lipoprotein(a) phenotype reduces breast cancer susceptibility by enhancing specificactivity of MUC1-binding anti-α-galactoside antibody through affinity maturation

Jessy John
Department of Biochemistry,
Sree Chitra Tirunal Institute for Medical Sciences & Technology, Kerla

Lipoprotein(a) [Lp(a)] consists of a molecule of low density lipoprotein (LDL) attached to a heavily O-glycosylated polymorphic protein, apolipoprotein(a) [apo(a)] through a disulfide bond. Apo(a) consists of several loop-like structures (kringles) mainly of type IV and V. Among kringle IV loops types 1 and 3-10 are present in single copies whereas kringle 4 type 2 is present in multiple copies varying in number from 3 to >40 among individuals, leading to apo(a) size variation between 300-800 kDa. Overall size of Lp(a) varies between 4.5-5.5x106 kDa. Plasma concentrations of Lp(a) show remarkable variation between individuals and an inverse relation exists between Lp(a) concentration and size. Most Lp(a) molecules in circulation attach additional molecules of LDL non-covalently to form adducts and STPS-containing region of Lp(a) is involved in adduct formation. Larger Lp(a) molecules with longer STPS-containing regions attach more LDL molecules and smaller Lp(a) molecules attach nil or few LDL molecules as adducts. Lp(a) size correlated negatively with cancer incidence for uknown reasons. Anti-α-galactoside (anti-Gal) is a natural anti-carbohydrate antibody in humans, constituting ~1% of immunoglobulins and mainly of IgG type. Anti-Gal antibodies react with hypoglycosylated MUC1 peptides (rich in serine, threonine and proline) which are expressed in large amounts on the surface of tumor cells but not on normal cells. We had shown that MUC1-specific anti-Gal forms immune complex with Lp(a) by binding to serine- and threonine-rich peptide sequence (STPS) in the O-glycan rich region of apo(a) subunit of Lp(a). Specific activity of anti-Gal antibody is the ratio of ligand binding activity to immunoglobulin content of the same amount of antibody and it differs among anti-Gal samples of different individuals. Purified anti-Gal was prepared from human plasma by single step affinity chromatography on cross-linked guar galactomannan. Lp(a) was prepared by affinity precipitation of plasma proteins with lectin jacalin followed by Tris-Borate-EDTA (TBE) electrophoresis and elution of lipoprotein bands.

Eugenol Attached to Biomembrane does not affect its Anti-inflammatory properties

Dr. Priyadarshini Mallick
HOD & Assistant Professor,
Dhruba Chand Halder College, Dakshin

Green Tulsi's botanical name is Ocimum sanctum. It is known to grow throughout the world in countries with tropical conditions. This plant is well known since the time immemorial in India for its medicinal values, probably that is the reason it has been given religious value atleast in the Indian sub-continent. Eugenol, an essential oil obtained from the Tulsi plant has been attributed with numerous medicinal values, therefore we have solution from the powder of dried leaf extract as well as from fresh leaf extract which has shown the similar effects without any significant differences in their activities. These observations lead to the casting of the Eugenol extracted from both the sources on biocompatible membrane using Poly Vinyl Alcohol (PVA). We have used various methods like biochemical tests, XRD & FTIR to confirm our results. Our results suggest that Eugenol from either of the sources remain the same with reference to its physiochemical and biochemical characteristics. Further studies to study the biological activities from both types of extract are in progress.

Evaluation of the role of Epithelial- Mesenchymal transition and Cancer stem cells in metastasis of Oral Squamous Cell Carcinoma using biomarkers

Dr. Sowmya S V
Department of Oral Pathology & Microbiology,
M.S.Ramaiah University of Applied Sciences, Bangalore

The involvement of lymph nodes is thought to be the first indication for spread of tumor cells and is a possible prognostic indicator in Oral Squamous Cell Carcinoma (OSCC). Currently, the 5- year survival achieved by patients with lymph node metastasis is 25%- 40% as against 90% without metastasis. Literature search also reveals that 15% to 60% of Oral Squamous Cell Carcinoma (OSCC) cases may show occult metastases to the cervical lymph nodes. Recently, many variables like tumor thickness, histology and various techniques like immunohistochemistry and molecular analyses have been developed that aid in the detection of metastasis in a primary lesion at an early date. However, none of these techniques can serve as independent indicators for prediction of metastasis due to the heterogenous clinical presentation of OSCC. Hence, there is scope to investigate the “Risk variables in metastasis of Oral cancer” to facilitate prompt and appropriate treatment to patients with low and high risk for metastasis. Tumor spread by invasion is facilitated by a highly orchestrated process, Epithelial- Mesenchymal Transition (EMT) that involves acquiring of a mesenchyme- like phenotype by the epithelial cells. The cells of epithelial origin that generally exhibit cohesive and polarized characteristics get transformed into spindle-shaped with absence of cohesiveness, polarity and increased mobility. These migratory characteristics of the neoplastic cells have high propensity for invasion and metastasis. Histopathological features like increased tumor budding at the invasive tumor front and various molecular events are currently believed to be representing EMT. The molecular processes include activation of transcription factors, expression of cell-surface, cytoskeletal and extracellular matrix degrading proteins and genes. Several biomarkers have been employed to identify the processes leading to EMT. Results: Significant differences were noted in the protein expression of EMT biomarkers: E- Cadherin ('p'=0.000), membranous β- Catenin (Cell surface adhesion molecules) ('p'=0.000), MMP2 ('p'=0.001), MMP9 (Extracellular matrix degrading enzymes) ('p'=0.000), CD44 ('p'=0.000) & CD133 ('p'=0.000) (Cancer stem cell markers) between metastatic and non-metastatic OSCC groups. But cytoplasmic expression of β- Catenin did not show significant differences between the study groups.Similar results were obtained with the gene expression of E- Cadherin ('p'=0.04), β- Catenin ('p'=0.002), MMP9 ('p'=0.000), CD44 ('p'=0.000) & CD133 ('p'=0.000) which has validated the findings of immunohistochemistry. Hence, E- Cadherin, β- Catenin, MMP- 9, CD44 & CD133 may be considered in the specific panel of biomarkers to assess the metastatic potential of OSCC.

POSTER PRESENTER ABSTRACT'S

Retinoblastoma dependent Hexokinase1 stabilization re-programs cancer metabolism and energy production

Vishnu Suresh Babu
GROW Research Lab,
Narayana Nethralaya Foundation, Bangalore

Biallelic inactivation of Retinoblastoma (RB1) causes paediatric ocular tumors. Retinoblastoma tumors reprogram their metabolism and energy production networks to support and enable rapid proliferation, invasion, metastasis and resistance to chemotherapy. The functional role of Rb protein in regulating cell cycle checkpoints and tumor growth is well documented, but the mechanisms underlying metabolic reprogramming and energy metabolism need further investigation. Thus we further investigated the molecular mechanisms underlying tumor metabolism and energy regulation module using an integrated multi-omics discovery platform and in vitro modelling. Approval of Institutional Ethics Committee and written informed consent from the family was obtained prior to sample collection. Enucleated eyes of 9 patients& 2 paediatric deceased controls were used for multi-omics analysis. WERI-RB1 cells were used for 3D spheroid formation, proliferation, migration, chemosensitivity as well as for investigating molecular signalling by immunoblotting and quantitative PCR. Hexokinase1 (HK1) and E2F2 were modulated by overexpression and shRNA constructs and Rb was complemented in WERI-RB1 by overexpression. All experiments were performed 48 hrs post transfection. Agilent Seahorse XFp was used to measure mitochondrial respiration, glycolytic rate and energy phenotype. Combined multi-omics analysis revealed revealed approximately 1700 significantly modulated genes (FC ≥10, $p \leq 0.005$). Of such targets, HK1 (FC=-17.46, $p < 0.005$) and E2F2 (FC=540.2, $p<0.005$) were further analysed for their functional role in tumor formation. HK1 overexpression in WERI-RB1 cells exhibited reduced 3D-spheroid formation, proliferation, migration and chemosensitivity ($p<0.05$) compared to controls while E2F2 knockdown showed the same effect. The phenotypes of HK1 knockdown was partially complemented by Rb overexpression, similar to E2F2 overexpression. Rb complementation induced significant stabilisation of HK1 protein and reduced E2F2 activity in immunoblots. Further, HK1 induced AMPKα phosphorylation without any change in its total protein levels. AMPKα phosphorylation correlated with reduction in ACC levels. Rb overexpression in presence of HK1 knockdown did not activate AMPKα or reduce ACC. E2F2 modulation did not have any effect on either AMPKα or ACC. In Seahorse XFp assay, Rb complemented WERI-RB1 cells had reduced reserve respiratory capacity ($p<0.01$), increased glycolytic rate ($p<0.05$) and reduced energy production ($p<0.01$).

Cigarette smoke induces mitochondrial metabolic reprogramming in lung cells

Niraj Babu
Institute of Bioinformatics,
International Tech Park, Bangalore

Carcinogenic effects of cigarette smoke is due to its chronic exposure and not acute. However, the molecular alterations in lung cells due to cigarette smoke have not yet been studied systematically. To understand the molecular alterations in the lung due to chronic cigarette smoke exposure, we carried out tandem mass tag (TMT)-based temporal proteomic profiling of lung cells exposed to cigarette smoke up to a period of 12 months. The proteomic analysis resulted in the identification of 2620 proteins in total, of which 671 proteins were differentially expressed (1.5-fold) after 12 months of exposure. Lung cells which were chronically exposed to smoke for 12 months presented dysregulation of oxidative phosphorylation and overexpression of enzymes involved in TCA cycle. In addition, we also observed overexpression of several enzymes involved in glutamine metabolism, fatty acid degradation and lactate synthesis among others. This could possibly explain the availability of alternative source of carbon to TCA cycle apart from glycolytic pyruvate. Our data indicates that chronic exposure to cigarette smoke leads to mitochondrial metabolic reprogramming in cells leading to their growth, survival and transformation.

Deciphering the Ephrin pathway and role of EMT in the formation of Vasculogenic Mimicry in patient derived breast cancer samples

Debarpan Mitra

Department of Signal Transduction and Biogenic Amines
Chittaranjan National Cancer Institute, Kolkata

Vasculogenic Mimicry (VM) is characterized by the formation of microvascular channels and very often linked to clinically aggressive tumours. However, the signalling paradigms that underpin this critical phenotype is yet to be deciphered. This study strives to find out the implications of epithelial mesenchymal transition (EMT) in the context of VM formation in breast cancer (CaBr). Dual Periodic Acid-Schiff (PAS) and Immunohistochemistry (IHC) by anti-CD31 antibody was carried out for the detection of VM channels. Further, the CaBr cohort (n= 62 median age= 50) was divided into VM positive and VM negative samples based on the PAS-CD-31 status. IHC was performed to delineate the EphA2 driven signalling mechanism and EMT markers in both the VM positive and negative CaBr. CaBr samples were stratified into VM positive and VM negative groups based on CD31and PAS dual staining. Expression of the critical Ephrin pathway proteins (i.e., pEphA2, total EphA2, pERK1/2 and Laminin 5γ2) in VM positive regions was statistically associated with VM (p value = 0.018), implying their roles in forming these pseudovascular micro-channels. EMT marker Vimentin was overexpressed and the expression of the epithelial marker E-cadherin was found to be comparatively low in VM positive regions asserting a mechanistic link of EMT in promoting Vasculogenic Mimicry in CaBr. This study explored a new role of VM-EMT crosstalk in CaBr pathogenesis and provided insights into development of novel rational therapeutics.

Targeted drug delivery system

Punam Borate

Research Scholar,

Targeted drug delivery, also known as smart drug delivery, is a method of treatment that involves the increase in medicament in one or few body parts in comparison to others.

Two strategies are widely used for drug targeting to the desired

1. Organ
2. Tissue:

Passive targeting and active targeting. Drug delivery vehicles transport the drug either within or in the vicinity of target. An ideal drug delivery vehicle is supposed to cross even stubborn sites such as a blood brain barrier (BBB) Recently, nano medicine has emerged as the medical application of nanotechnology. Since nanoparticles are very small in size, nano drug delivery can allow for the delivery of drugs with poor solubility in water and also aid in avoiding the first pass metabolism of liver. Nanotechnology derived drug delivery can cause the drug to remain in blood circulation for a long time, thereby leading to lesser fluctuations in plasma levels and therefore, minimal side effects. These include polymer-drug conjugates and nano particulate systems such as liposomes, quantum dots, dendrimers, etc. There are several other approaches as well. These also include the strategies wherein the therapeutic agents are coupled with “targeting ligands” that possess the ability to recognize antigens associated with tumors.

Improvement in solubility and dissolution of hydrophobic drugs: By solid dispersion technique

D. Christopher Vimalson

Recent innovation of combinatorial chemistry and high throughput screening can efficiently discover new drugs of good pharmacological activities. However 35-40 % of these newly discovered drugs by recent technologies suffer from poor aqueous solubility. Aqueous solubility is an important criterion for fast dissolution and good absorption that are essential for effective pharmacological action. The present study was aimed to enhance the solubility of poorly water soluble drugs (BCS Class II) Fenofibrate and Febuxostat, individually, using water soluble polymers such as Poly ethylene glycol (PEG 6000) (fusion method) and Poly vinyl pyrollidine (PVP K30) (solvent evaporation method) in various ratios of 1:1, 1:2, 1:3 and 1:4, respectively. Initially, pre-formulation studies like drug excipient compatibility studies by DSC and determination of saturation solubility of drug in various media like distilled water, 0.1N hydrochloric acid and pH 7.4 phosphate buffer, were performed. The formulated solid dispersions were evaluated for percentage yield, drug content and *in vitro* dissolution studies. The pre-formulation studies revealed that there was no interaction between drug and excipients and the pure drug was poorly soluble in water. The percentage yield of all formulations were in the range of 60-96.67 % and 54-78 % and the drug content for Fenofibrate and Febuxostat was in the range of 56-82 mg and 43-78 mg, respectively. The solid dispersion containing polyvinyl pyrollidine K 30 in 1:4 ratio showed highest amount of drug release at the end of 30 minutes than other formulations in both the drugs. The results concluded that the solid dispersion prepared with PVP K-30 in 1:4 ratio by solvent

Insilico Exploration of Thiazolidin-4-one derivatives as Potential Mutant Inhibitors of HIV-1 Reverse Transcriptase Enzyme

Rajala Srikala
Research Scholar,
Jawaharlal Nehru Technological University, Anantapur

Reverse transcriptase (RT) is an attractive and crucial target for the replication of HIV-1 virus and for the development of anti-HIV drugs. The virally encoded reverse transcriptase (RT) enzyme is responsible for the conversion of its single-stranded RNA to double-stranded DNA. Currently, five NNRTIs i.e., nevirapine, delavirdine, efavirenz, etravirine and rilpivirine have been emerged against RT for the clinical treatment of AIDS. However, NNRTIs therapy is become inactive against HIV-1 virus multiplication due to the development of drug resistance. In the present work, we evaluated a set of selected C-2, N-3 and C-5 modified thiazolidin-4-one analogues to identify potential pharmacophoric features against the wild type and mutant strains by using molecular docking approach. Docking results obtained from thiazoldin-4-ones in to the active site of RT by using Molecular Operating Environment (MOE) program indicated that the compounds showed a comparable potency with retention of activities against the single mutant strains of Lys103Asn and Tyr181Cys, of HIV-1 reverse transcriptase enzymes. Among the designed analogues, compounds having 4-(4-nitrobenzyloxy)phenyl, 2-(4-chlorophenylthio)phenyl, 5-(4-methoxyphenyl)thiophen-2-yl) at C-2 and 2,4-dinitrophenylamino & 4-(phenyldiazenyl)phenyl at N-3 of thiazolidin-4-one showed significant binding free energy against Lys103Asn (-16.96, -16.69, -17.17, -15.43 & -16.08 kcal/mol) and against Tyr181Cys (-12.33, -10.36, -10.78, -10.53 & -11.16 kcal/mol) of HIV-1 RT, respectively. The molecular insight study of proposed, thiazoldin-4-ones might be useful in the design of novel RT inhibitors with high ligand efficacy on single mutant strains.

Efflux Modulating Activity of Mucuna cochinchinensis Seeds

Deekshitha H S
Department of Pharmaceutical Chemistry,
T John College of Pharmacy, Bangalore

Mucuna cochinchinensis (Lour.) Cheval (Leguminosae) commonly known as 'Lyon bean' is an annual twining herb with high content of L- dopa, a drug of choice in Parkinson's disease. The aim of this work was to analyze the modulating effect of *M. cochinchinensis* seed extracts in efflux pumps providing the antibiotic tolerance/resistance of microbes. Ethidium bromide accretion and accumulation assay were done on resistant fungal strains and efflux pump assay to determine the effluxing ability of fungal strain were performed. Synergetic effect of methanolic (MMC) and ethyl acetate extract (EMC) of *M.cochinchinensis* with standard drug were also done. Resistant fungal strains were subjected to efflux ability studies. Maximum effluxing ability was determined from the experimental data and it was found to be 105 min and 75 min by *Candida albicans* for MMC and EMC respectively and 45 min and 105 min by *Aspergillus niger* for MMC and EMC respectively. Profound synergistic effect of inhibition was observed with combined MMC and standard Clotrimoxazole when compared to the standard alone; against *C. albicans* which indicates the modulating efficacy of MMC.

Comparative evaluation of fruits of garcinia indica from different regions of south india by HPLC

Divya P
Department of Pharmaceutical Chemistry,
T John College of Pharmacy, Bangalore

Comparative evaluation of fruits of *Garcinia indica* samples collected from four different regions was carried out by HPLC method. *Garcinia indica* commonly known as kokum is a popular Indian spice. The fruits are known to contain garcinol, hydroxycitric acid(HCA), citric acid, lactone and several polyphenolic compounds. Hydroxy citric acid (HCA) is the major constituent and is a popular component of the weight loss formulations, available as herbal supplements, which decrease adipose tissue weight after ingestion for a few weeks. There are wide variations in naturally distributed kokum. Methanolic extracts were prepared and subjected to preliminary phytochemical screening by applying different qualitative tests for phytoconstituents. The amount of phytoconstituents including HCA, lactone and citric acid were quantified using HPLC in all the samples. There was a significant variation in amount of HCA in all the four samples. Sample collected from Karnataka was found to contain maximum amount of HCA.

Biosynthesis and cytotoxicity of kojic acid from *aspergillus niger*

Pushpaveni C
Department of Pharmaceutical Chemistry,
T John College of Pharmacy, Bangalore

Kojic acid (KA) is a secondary metabolite produced by some species of fungi from the genera *Aspergillus, Penicillium* and *Acetobacter,* it is produced biologically by different types of fungi during aerobic fermentation using various substrates. This study aimed at isolation of kojic acid from *Aspergillus niger* MTCC 2208 and to evaluate the cytotoxic activity of kojic acid against skin cell line (3T3L1).The selected fungal strain for our study is *Aspergillus niger* MTCC 2208 and was procured from IMTECH, Chandigarh. Submerged fermentation technique was adapted to biosynthesize Kojic acid from *Aspergillus niger*. The highest production of kojic acid was obtained at a concentration of 55g glucose and 5g of peptone as an organic nitrogen source and the yield was 1144.7µg. Kojic acid was tested against Skin cell lines (3T3L1) and IC 50 was found to be 513.33±5.77 µg/ml.

Design and development of emulgel formulation containing metronidazole

Nagamani H B
Department of Pharmaceutical Chemistry,
T John College of Pharmacy, Bangalore

The aim of present work was to enhancing the topical delivery of Metronidazole by formulating emulgel system. Emulgel formulations of Metronidazole were prepared using different concentrations of gelling agent of sodium alginate and HPMC. Tween-20 and span-20 were used as emulsifiers, and propylene glycol as a humectant in gel was selected for the preparation of emulgel. The prepared emulgels were evaluated for appearance, pH, spreadability, viscosity, drug content and in-vitro drug release. All the prepared emulgels showed acceptable physical properties concerning colour, homogeneity, consistency, spreadability, and with higher drug release than conventional gel. The study concluded that topical delivery by emulgel formulation shows better drug delivery than conventional gel preparation method

Effect of inclusion complexation on solubility of aceclofenac

Pooja K
Department of Pharmaceutical Chemistry,
T John College of Pharmacy, Bangalore

The aim of the present study is to investigate the effects of β-cyclodextrin (βCD) on the solubility and dissolution rate of aceclofenac. Inclusion complexation were prepared by physical trituration method, kneading method and solvent evaporation method at drug to cyclodextrin weight ratios of 1:1, 1:2, 1:4 and 1:8. Different ratios of complexed substances were used to determine solubility and this optimized combination was utilized in preparing solid dispersions and were also compressed to form tablets. Dissolution studies of conventional and prepared tablets were done using USP Type II apparatus. The study was concluded that all the methods increased the solubility and dissolution rate of aceclofenac via inclusion complexation with βCD. It also concluded that the concept of inclusion complexation is novel, safe and cost-effective technique for enhancing bioavailability of poorly water-soluble drugs.

Novel and efficient extraction method for isolation of phytoconstituents of milk thistle

Ahmad Zonoubi
Department of Pharmaceutical Chemistry,
T John College of Pharmacy, Bangalore

Silybum marianum (Compositae/Asteraceae) is an annual or biennial thistle-like plant (Milk Thistle) as a relatable point in the Mediterranean territory of Europe. Milk thistle has been utilized since the time of antiquated physician and botanists to treat a liver enlargement (Hepatomegaly), gallbladder clutters, counting hepatitis, cirrhosis, and jaundice. It also helps in protecting liver from toxic chemical and natural poisons, counting wind nibbles, insect stings, mushroom harming, and alcohol as well as in the treatment of diabetic mellitus. Study consisting of preparation of extracts using counter-current extraction process and phytochemical investigation of prepared methanol extract of the selected plant seeds, which showed the presence of saponins, flavonoids, phenolic compounds and flavonolignans etc. The new method was developed using different chromatographic techniques such as TLC, column chromatography using various solvents like benzene, ethyl acetate, acetone, methanol, ethanol etc., which helped in the isolation of different fractions corresponding to saponins, flavonolignans, and isomers of flavonolignans. The various isomers such as Silybin A, Silybin B, Isosilybin A, Isosilybin B, Silychristin A, Silychristin B, Silydianin were isolated using various solvents through column chromatography. The present study was based on the development of the novel method for the isolation of the various isomers of flavonolignans which

Isolation and phytochemical investigation fruit of morinda citrifolia

Pradeepa Prasad
Department of Pharmaceutical Chemistry,
T John College of Pharmacy, Bangalore

Morinda citrifolia L. has been recognized as an important herb for treating various physiological disorders worldwide. M. citrifolia is commonly known as Indian mulberry or Noni in India. In this study, our focus is to isolate and partially purify the molecules responsible for biological activity. M. citrifolia has wide range of therapeutic uses in ailments such as arthritis, burns, headache, wounds and skin infections. M. citrifolia parts including fruits, seeds, barks, leaves, and flowers are utilized on their own for individual nutritional and therapeutical values, however, the fruit is considered to contain the most valuable chemical compounds. The fruits of M.citrifolia were extracted by several methods and evaluated using HPLC, MASS and NMR. Noni fruit juice were extract with ethanol using simple maceration technique. The major phytochemical components found to be phenolic compounds, anthraquinones, organic acids, beta-carotenoids, terpenoids (Fermented fruit extract), alkaloids, non-volatile and volatile components. The crude extract shown the positive test for sugar and ester

Synthesis and characterization of novel 1,3,4-oxadiazole derivatives

Karthika C. Thankacehen
Department of Pharmaceutical Chemistry,
T John College of Pharmacy, Bangalore

Heterocyclic compounds of 4-hydroxycoumarin and 1,3,4-oxadiazole are considered an important class of compounds in medicinal chemistry because of their interesting diversified biological activities. 1,3,4-Oxadiadoles have created interest in synthetic organic and medicinal chemistry as surrogates of carboxylic acid. A series of new 4-hydroxy coumarin bearing 1,3,4-oxadiazole derivatives have been conveniently synthesised. 2,4-dihydro-3Hpyrazole-3-one was treated with various substituted aromatic acids in presence of POCl3 to give 1,3,4-oxadiazole derivatives. The structures of the synthesized compounds are characterized by spectroscopic methods namely 1H Nuclear Magnetic Resonance (NMR), Infrared (IR), Mass Spectrometry (MS) and melting point.

Knowledge, attitude and practice of self medication for respiratory tract infection among undergraduate students in a tertiary care hospital of Assam

Siddhartha Shankar Patowary
Department of Pharmacology,
Assam Medical College and Hospital,Dibrugarh

To evaluate the knowledge, attitude and practice of self medication for respiratory tract infection among undergraduate students in a tertiary care hospital.130 Questionnaire were used out of which 107 students responded completely. So percentage of students practicing self medication was 82.3%. Out of 107 students 62(57.9%) were male and 45(42.1%) were female. Mean age of students was 22. Most common cause for practicing self medication was for time saving(34.6%) and source of information was from textbooks(28%). Most common source of medicines was from medical stores(50.5%). Most commonly used drug for respiratory tract infection was antibiotics(72.9%) followed by gurgle(13.1%) followed by lozenges(8.4%). Most commonly used antibiotic was amoxyclav(47.4%) followed by azithromycin(28.2%). Number of students having awareness of the harmful effects of self medication for respiratory tract infection were 84(78.5%). Respiratory tract infection is an infection of the upper or lower respiratory tract. Most of the cases are self limiting. Undue and unnecessary use of antimicrobial drugs can lead to antibiotic resistance, adverse drug reaction and waste of money. The UG students have an average KAP for self medication of respiratory tract infection. Hence proper education and counselling should be initiated among UG students to increase the awareness of self medication for respiratory tract infection.

Knowledge , Attitude and Practice of self medication for headache among undergraduate students in a tertiary care hospital of Assam

Dr. Rituraj Benode Deb
Department of pharmacology
Assam medical college and hospital, Dibrugarh

To evaluate the knowledge , attitude , and practice of self medication for headache among undergratuate students in a tertiary care hospital. 130 questionnaire were used out of which 122 students responded competely. So percentage of response was 93.84%. Out of 130 students 64(52.5%) were male and 58(47.5%) were female. Mean age of students was 21yrs. Most common cause for practicing self medication was cost saving(36.06%) and source of information was previous prescription(28.68%). Most common source of Medicines was seniors(44.26%). Most commonly used medication for headache was CALPOL(50.8%) followed by VICKS BALM(18.85%) followed by DISPRIN(13.93%). Number of students having awareness of the harmfull effects of self medication for headache were 111(90.98%). The most common adverse effect experienced by the students was nausea(65.57%) followed by vomitting(25.40%) followed by bowel problems(4.91%). Headache in most of the cases is a self limiting condition if not preceded by any trauma and in most of the cases require immmediate evaluation. Undue and unnecessary use of analgesic drugs can lead to masking of the underlying pathology , adverse drug reaction and waste of money. Due to lack of proper management there can be high chance that the disease pathology can change its course from acute to chronic. The undergraduate students have an average KAP for self medication of headache. Hence proper education and counselling should be initiated among undergraduate students to increase the awareness of self medication for headache.

Design and characterization of proniosomal gel of valsartan

Arpitha Kharvi
Department of Pharmaceutics
T John College of Pharmacy, Bangalore

Valsartan is an angiotensin-II inhibitor belonging to BCS class III, having low permeability and high solubility. The oral bioavailability of valsartan is 23% and has a biological half-life of 3-5 hours. The aim of the present study was to develop and characterize valsartan proniosomes which was further formulated as gels to improve the permeability and hence enhance the bioavailability. Non-ionic surfactant based proniosomal gels of valsartan were prepared by co-acervation phase separation method by using different span grades like 20, 40, 60, 80. The prepared formulations were characterized for encapsulation efficiency, shape, size and in-vitro diffusion studies. The results showed that Valsartan had good entrapment efficiency in all the formulations. The proniosomal gel formed from span-60 as surfactant was found to have more appropriate data and diffusion profile

Development and characterization of proliposomal gel containing metformin hydrochloride

Rehana Begum A
Department of Pharmaceutics
T John College of Pharmacy, Bangalore

Metformin hydrochloride is an oral hypoglycaemic which has been widely used as first line treatment of type-II diabetes but in a very high dose 2-3 times a day. The documented side effects of oral route are lactic acidosis, gastric discomfort and chest pain. The present study was investigated to develop and characterize proliposomes of Metformin hydrochloride which further formulated as gels to overcome the problems related with oral route. Proliposomes of metformin hydrochloride were prepared by thin film hydration technique in which different natural polymers were taken as variables. The prepared formulations were characterized for encapsulation efficiency, shape, size and in-vitro diffusion studies. The proliposomal gel formed from albumin polymer was found to have more appropriate diffusion profile.

A study on knowledge , attitude and practice of self medication for diarrhoea among undergraduate students in a tertiary care hospital of assam

Dipsikha Das
Department of pharmacology
Assam medical college and hospital, Dibrugarh

To evaluate the knowledge , attitude , and practice of self medication for diarrhoea among undergratuate students in a tertiary care hospital. 130 questionnaire were used out of which 116 students responded for practising self medication for diarrhoea. So percentage of students practising self medication was 89.23%.Out of 116 students 56 (48.3%) were male and 60(51.7%) were female. Mean age of students was 23. Most common cause for practicing self medication was for time saving (32.75%%) and source of information was from textbooks (38.79%). Most common source of medicines was medical stores (48.28%%). Most commonly used drug for diarrhoea was ORS (47.41%) followed by metronidazole (26.72%) followed by ofloxacin (13.79%).Number of students having awareness of the harmful effects of self medication for diarrhoea were 96(82.75%). Diarrhoea is a self limiting condition in most of the cases requiring sufficient amount of fluid replacement therapy.Undue and unnecessary use of antimicrobial drugs can lead to antibiotic resistance , adverse drug reaction and waste of money.Due to lack of adequate fluid replacement there will be high chance of dehydration and electrolyte imbalance. Self medication practice for diarrhoea is highly prevalent among undergraduate students. Hence proper education and counselling should be initiated among UG students to increase the awareness of self medication for diarroea.

Effect of novel coprocessed of superdisintegrants on oral dispersible tablet of aceclofenac sodium

Nanditha M
Department of Pharmaceutical Chemistry,
T John College of Pharmacy, Bangalore

Co-processing is an alternative way that new excepients are entering to market to experiencing the through well being testing of a totally new chemical. It could be characterised as consolidating two or more settled excipients by a fitting procedure. Co-processing of excipients could prompt the development of excipients with better properties thought about than the basic physical mixtures of their components in the present study the novel co-processed superdisintegrants were prepared by solvent evaporation method. A blend PVP and Sodium starch glycolate in the ratio of 1:1 ,1:2 and 2:1 prepared and evaluated for bulk density, tapped density ,carr's index and angle of repose. In the present study aceclofenac is used as a model drug. Tablets were prepared by direct compression technique using novel co-processed super-disintegrants and evaluated for thickness, weight variation test, drug content, hardness, friability, and invitro drug release studies.

Preperation and comparative evaluation of gastro retentive floating tablets using different hydrophobic retardents

Mohammed Saeed
Department of Pharmaceutics,
T John College of Pharmacy, Bangalore

The study was undertaken with an aim to develop and evaluate gastro retentive floating tablet used for hypertension where the drug is released in sustained manner. Losartan potassium is considered as the model drug which is orally active, non peptide angiotensin-II receptor antagonist. This novel agent binds competitively and selectively to all the subtype 1 (AT(1)) receptor, there by blocking all induced physiological effects. Three different hydrophobic retardents namely carnauba wax, hydrogenated castor oil and cetyl alcohol were used for the formulation of floating tablets of losartan potassium. The prepared formulations were characterized for friability, hardness, buoyancy lag time, total floating time, in-vitro drug release profile and release kinetics. Formulation with hydrogenated castor oil as a hydrophobic retardant was considered as the optimized formulation

Development and characterisation of simvastatin nanosuspension

Tanzeel Majeed
Department of pharmaceutics
T John College of Pharmacy, Bangalore

Simvastatin is a hydrophobic drug belonging to class II of the biopharmaceutical classification, which has low solubility. So the dissolution process of the drug acts as the rate controlling step and therefore, it is necessary to improve the solubility and dissolution of the drug. The drug is poorly absorbed from the gastrointestinal tract (GI) tract. The plasma half-life of oral Simvastatin is 3 hrs, which is excreted by the kidney, and therefore it is important to enhance the aqueous solubility and dissolution rate which improves bioavailability of its oral dosage form by developing Simvastatin Nanosuspension. The Nanosuspension was formulated by using various stabilizers in order to optimize a more stable Nanosuspension . The optimized batch of Simvastatin Nanosuspension was evaluated by particle size, surface morphology, zeta potential, entrapment efficiency and in-vitro drug release profile

Solubility enhancement of simvastatin by solid dispersion technique using different polymers

Lakshmikanth G.
Department of Pharmaceutics,
T John College of Pharmacy, Bangalore

Simvastatin is a selective competitive inhibitor of HMG Co-A reductase, which is lipid lowering agent used for the treatment of hyperlipidaemia. Simvastatin belongs to the BCS class-2 having low solubility and half-life of 2-4hrs. Due to its low solubility the oral bioavailability of the drug is only 5%. To enhance the solubility of drug, solid dispersion was prepared by Fusion/Melt method by using two different polymers i.e., hydroxy propyl methyl cellulose (HPMC) and methyl cellulose in the ratio 1:1 and 1:2 respectively. Formulation was optimized on the basis of acceptable solid dispersion properties such as angle of repose, carr's index, drug content uniformity, % practical yield, in-vitro drug release and release kinetics.

Design and optimization of microsponge gel by quality by design using aceclofenac as a model drug

Mohd Iqbal Bhat
Department of Pharmaceutics,
T John College of Pharmacy, Bangalore

The present study deals with the formulation of Aceclofenac loaded Microsponges for topical delivery of the drug to facilitate the controlled release. The objective of the present study was to formulate microsponge gels for effective treatment of Rheumatoid arthritis, Osteoarthritis and related pain disorders where efficacy and patient compliance are of prime importance. Aceclofenac Microsponges were prepared by quasi emulsion solvent diffusion method using ethyl cellulose as a polymer, polyvinyl alcohol, acetone as internal phase volume and liquid paraffin as external phase volume. For the development of Microsponges Quality by Design approach was implemented based on risk assessment of critical quality attributes (CQAs). The prepared formulation was optimized for Independent variable of formulation like Drug Concentration, PVA Concentration, Internal Phase Volume and Speed of Stirring. The prepared formulations were evaluated

Formulation and characterization of proniosomal gel of baclofen

Habeebu Rahman K. P.
Department of Pharmaceutics
T John College of Pharmacy, Bangalore

Baclofen is an anti-spastic agent and skeletal muscle relaxant and belong to BCS class III drug having low permeability and high solubility. The half-life of the drug is 1.5 to 4 hours in plasma which is rapidly and extensively absorbed and eliminated. Non-ionic surfactant based proniosomes of baclofen were formulated by co-acervation phase separation method by using different surfactants like span and tween of two different grades. The prepared formulations were characterized for encapsulation efficiency, shape, size. This was further formulated as gels using various surfactants and in-vitro diffusion studies were performed. The results showed that Baclofen in all the formulations were successfully entrapped. The proniosomal gel formulated using span 60 as a surfactant was found to be better formulation when compared with the formulations in which tween were used as surfactant

Comparative evaluation of tablets formulated by artocarpus heterophyllus, flax seed and gum acacia as natural gum

Dilraj E
Department of Pharmaceutics,
T John College of Pharmacy, Bangalore

The objective of the work was to formulate and compare different natural binder at various concentrations as they are safe and economical. Binding agents are useful in achieving appropriate mechanical strength and drug release properties for the formulation of tablets. Natural binders like Artocarpus heterophyllus, Flaxseed, Gum acacia were taken in different ratios that is 2, 4, 6, 8 respectively. Tablets were prepared by wet granulation method and the drug excipients incompatibility was ruled out by FTIR studies. Evaluation studies like drug content, disintegration time, hardness, friability and in-vitro drug release profile for different formulations were performed. From this study it was concluded that the tablets formulated by all natural binders showed good and effective release with various concentration in which the binder flax seed showed better drug release when compared to other binders.

Preparation and evaluation of bromhexine hydrochloride floating microspheres using different polymers by quasi emulsion solvent diffusion method

Hiranjith A.
Department of Pharmaceutics,
T John College of Pharmacy, Bangalore

Bromhexine hydrochloride is a mucolytic agent (expectorant) used in the treatment of respiratory disorders associated with viscid or excessive mucus. The present study was to prepare floating microsphere of the bromhexine hydrochloride by quasi-emulsion solvent diffusion method in order to achieve gastro-retention which may result in the improvement of solubility and bioavailability, thereby reduce dosing frequency and better patient compliance. The floating microspheres were prepared by using non effervescent polymers like eudragit, hydroxy propyl methyl cellulose(HPMC) and hydroxy ethyl cellulose(HEC). Preformulation studies were performed in which all the formulations showed excellent micromeritic properties. The prepared formulations were characterized for in-vitro drug release, buoyancy lag time and the total floating time. The formulation containing eudragit as a non-effervescent polymer showed better in-vitro drug release and total floating time.

Formulation and evaluation of gel containing nanoparticles of carica papaya leaf extract

Lidiya Joy
Department of pharmaceutics
T John College of Pharmacy, Bangalore

Nanoparticles are particulate dispersions or solid particles drug carrier. The smaller size of nanoparticles is gaining importance in research for the treatment of various diseases. Moreover the production of nanoparticles is eco-friendly and cost effective. Carica papaya leaf extract inhibit the pathogenic bacteria by its Antibacterial activity. Carica papaya loaded nanoparticles were formulated by Solvent evaporation method for enhanced absorption and hence effective antibacterial effect. It was evaluated for several parameters like Drug Content, Particle Size, In-vitro release study. The prepared nanoparticles were incorporated into gel for topical delivery. The gels where formulated with different ratios of gelling agents and various parameters were evaluated ie., ph, viscosity, spreadability, in-vitro diffusion studies and Antibacterial activity was screened against both gram-negative and gram positive microorganisms. Thus, this method can be used for rapid and eco-friendly synthesis of biocompatible nanoparticles possessing, Antibacterial activity suggesting their possible application in medical industry.

Formulation and characterization of ethosome loaded sodium cromoglycate gel

Zahra Mafibaniasadi
Department of Pharmaceutics,
T John College of Pharmacy, Bangalore

Ethosomes are soft vesicles and novel vesicular carrier for improved delivery of therapeutic agents through skin. They are chiefly composed of phospholipid, high concentration of ethanol and water. They have the ability to penetrate and deliver the drug to the deep layer of skin. Sodium cromoglycate (cromolyn) belongs to the class of medication called mast cell stabilizers, it is used to prevent symptoms associated with asthma. The recent study shows that; it is also useful in the treatment of skin atopic dermatitis in children (also call as eczema). Due to the safety of sodium cromoglycate in children, it can be formulated as Ethosomes gel to increase its skin permeability and reduce the dose and dose frequencies and enhance ease of application. Ethosomes loaded sodium cromoglycate were prepared by hot method. The resultant Ethosomes were evaluated for %yield, drug content, In vitro drug release. The designed Ethosomes were formulated to gel dosage form for further application. The gel formulation was done by using different gelling agents to optimize the formulation. The gel of Ethosomes were evaluated for spreadability, ph., viscosity, In vitro drug diffusion and the optimized

Formulation and comparative evaluation of losarten potassium niosomes by using different techniques

Ajmal C.
Department of Pharmaceutics,
T John College of Pharmacy, Bangalore

Niosomes or nonionic surfactant vesicles are a type of carrier for transporting drug molecule to its site of action. Niosomes have the ability to entrap both hydrophilic and hydrophobic drugs. Losarten potassium is an angiotensin II type 1 receptor (AT1) antagonist used mainly to treat high blood pressure, either alone or in combination with other anti hypertensive drugs. Bioavailability of Losartan is reported to be very low (between 25-35%) and half life of 1.5 - 2 hr. Since Losartan has a very low bioavailability, formulating as Niosomes can increase its bioavailability drastically, thereby dosage can be minimized. Niosomes of Losarten potassium were prepared by three different methods that is, Solvent evaporation, Rotary evaporation, and Ether injection. The formulated noisomes from the above mentioned methods were evaluated for entrapment efficacy, percentage yield, drug content and *in vitro* drug release. The vesicles which were formed by rotary evaporation technique were found to have more appropriate data and *in vitro* drug release profile.

Cigarette smoke and chewing tobacco selects for differential expression of miRNAs in oral keratinocytes

Mohd Younis Bhat
Institute of Bioinformatics
International Technology Park, Bangalore

Carcinogenic effect of tobacco in oral cancer occurs through chewing or smoking of tobacco or both. Though significant differences have been observed in the development of oral cancer between tobacco users and non-users, but difference in molecular alterations at miRNA and proteome level induced by chewing and smoking tobacco remain unclear. To understand this, we developed cellular models where non-neoplastic oral keratinocytes (OKF6/TERT1) were chronically treated with either chewing tobacco or exposed to cigarette smoke for 6 months. Chronic exposure to tobacco (chewing and smoking) resulted in higher cell scattering and invasive ability of normal oral keratinocytes. Using these cell line model systems we studied the differential expression of miRNAs and proteins associated with chewing or smoking form of tobacco. Employing Illumina HiSeq 2500 platform we identified a total of 427 and 456 annotated miRNAs in tobacco and cigarette smoke exposed normal oral keratinocytes, respectively. Amongst these 10 and 6 miRNAs were significantly dysregulated (≥ 4 fold; p≤ 0.05) in tobacco and smoke exposed cells respectively. Integrating the data with our *in-house* proteomic data on the same tobacco and cigarette smoke treated cells we identified 36 and 16 protein targets respectively which showed directional correlation with the significantly dysregulated miRNAs. Our study demonstrates unique alterations in miRNA expression in oral cells in response to the two form of tobacco used. We also identified 18 high confidence novel miRNA in cells exposed to smoke and 6 in cells treated with chewing tobacco. Integrated analysis of dysregulated miRNAs in conjunction with their proven targets indicates that the signaling mechanism leading to oncogenic transformation is distinct for the two forms of tobacco used.

Proteomic analysis of oral cancer patients delineated by tobacco usage habits

Firdous Ahmad Bhat
Institute of Bioinformatics,
International Technology Park, Bangalore

Tobacco usage is a known risk factor associated with development of oral cancer. It is mainly consumed in two different forms (smoking and chewing) that vary in their composition and methods of intake. India has one of the highest rates of oral cancer in the world. Despite being the leading cause of oral cancer, molecular alterations induced by tobacco are poorly understood. There are limited number of studies which have investigated the effects of chewing tobacco on oral epithelia. In this study we studied the proteomic alterations in oral cancer patients based on their tobacco using habits (tobacco chewers and those with no habits). Proteomic analysis of oral cancer primary tissue samples (from chewing tobacco users and those with no habits) was carried out using tandem mass tags (TMT) labelling strategy using high-resolution Fourier transform Orbitrap Fusion mass spectrometer. This led to the quantification of 3,139 proteins. 355 proteins were found dysregulated, of which 147 and 63 proteins were dysregulated exclusively in tobacco chewers and those with no habits respectively (≥1.5 fold and p-value ≤0.05). Pathway analysis of proteins which were overexpressed in chewers revealed that a large majority of them to be involved in cell cycle, protein synthesis, cellular growth and proliferation. Similarly, pathway analysis of proteins which were downregulated revealed that they are involved in mitochondrial dysfunction and oxidative phosphorylation. This study can serve as a scaffold to understand the molecular alterations in oral cancer based on tobacco using habit of a patient and enable in the identification of early detection markers to identify high risk population.

Edible chemotherapy using Exosomal-Drug Delivery

Anula Divyash
Cell & Molecular biology Research Center
Apollo Health Educational and Research Foundation, Hyderabad

A large proportion of lipophilic drugs is water insoluble and thus requires the use of specialized delivery vehicles (e.g. micelle, liposome, etc.) for parenteral administration. These nano-sized delivery vehicles are often complex and are difficult to manufacture and are immunogenic, and/or cause toxic side effects. Recently, exosomes have begun to be explored for use as drug delivery vehicles for non-native therapeutics. Milk provides a viable alternative source of scalable exosomes for human consumption and development of edible chemotherapy. We have developed a novel clinical methodology for isolation, purification, characterization of bovine exosome from milk. Milk exosomes were isolated bydifferential PEG precipitation. Quality control of exosome formulation is established through various biophysical, biochemical and molecular biology methods. Protein, lipid, acetyl choline esterase activity, DioC6 staining were some of the biochemical methods. Quality control of exosome-curcumin formulation was established with DLS, NTA, Transmission Electron microscopy.Stability and solubility of exosomal curcumin was established by spectroscopy and HPLC.In vitro fluorescence imaging of Milk Exo curcumin was done to monitor entry and stability of milk exosome.Cytotoxicity studies were conducted in triple negative breast cancer cell line MDA Mb231. Milk exosome isolation carried by PEG MW 3000 – 20,000 (6 - 16% in 0.5M NaCl) precipitation method was subjected to biochemical and biophysical characterization to ensure the quality and purity of exosome population. 90% of the isolated vesicle population was exosome as confirmed by DLS, Nano sight. Isolated vesicles were in the size range of 50-150 nm as confirmed by TEM. Spectrometric analysis showed that Bovine exosomal Curcumin is stable in PBS than pure curcumin. Loading efficiency of Curcumin into the bovine exosomes is 70% when loaded passively in the ratio of 1:5. Fluorescence imagingis used to confirm entry kinetics invitro.Cytotoxicity studies of exosomal curcumin in comparison with vehicle-less curcumin in MDA MB 231 cell line (breast cancer) showed toxicity at lower doses.

A study on the prescribing trends of ocular allergies in a tertiary care teaching hospital of assam

Luna Kuli
Department of Pharmacology
Assam Medical College and Hospitals, Dibrugarh

To study the prescription pattern of drugs used in the treatment of ocular allergies in a tertiary care teaching hospital of Assam and to assess the rationality of drug use. A retrospective study was conducted at the Department of Ophthalmology, Assam Medical College and Hospital, Dibrugarh, Assam for a period of two months from 1/01/2018 to 28/02/2018.A total of 186 prescriptions were evaluated.Patients of either sex and all ages were included.Patients with concomitant diseases like diabetes, hypertension etc. were excluded (*Suman RK et al,* 2015). Commonest ocular allergy was simple allergic conjunctivitis. Male : female ratio was 1.95. Commonest age group affected was 31-40 yrs .Average number of drugs per prescription was 2.40. Olopatadine was the most commonly prescribed drug. Topical route was the commonest.Most drugs were prescribed from Essential Drug List 2016 Assam. The demographic details of the patient ,chief complaints, findings, diagnosis, R_x symbol, doctor's signature were present in all prescriptions.

Genetic and Epigenetic factors involved in Wilms' Tumor in Indian Population

Aphrodite Chakraborty

Department of Pathology
All India Institute of Medical Sciences, Patna

Wilms' Tumor (WT) is the most common cancer of kidneys affecting the paediatrics age group. WT development is influenced by several genetic and epigenetic factors during embryogenesis. Two genes - WTI (located on chromosome 11p13) and WTII (on chromosome 11p15) have been widely implicated in several cases. WTI, a major player in WT pathogenesis, encodes a zinc finger transcription factor that is inactivated in the germline of children with genetic predisposition to WT and a subset of sporadic cases, causing aberrant kidney development as well as influencing abnormal genitourinary development, and, in certain cases, haematopoiesis (Lee and Haber, 2001). Although there have been vast advances in understanding the pathogenesis of WT over the last 30 years, the mechanisms responsible for disruption of normal embryonal differentiation remain unclear (Hohenstein et al. 2015). The involvement of several other factors, particularly the role they play in inducing malignancy and metastasis, are yet to be determined. Tumor microenvironment, particularly the role of cytokines, have been widely recognised as having an important role in disease development. In this regard, we studied the role of TGF RI receptor, which is involved in the TGF β signalling pathway. The TGF β signalling pathway is involved in inducing a plethora of biological pathways such as cell growth, differentiation, immune response, angiogenesis, inflammatory response, and immortalization, thereby exerting tumor suppressor effects in normal and early tumor cells, and the disruption of this pathway leads to development of several human cancers (Fabregat et. al., 2014). In several cancers, the role of TGF β has been investigated, but there exists a glaring lack of data regarding the significance of TGF β signalling pathway in paediatric tumors, and particularly WT with respect to our country. Additionally, since WT pathogenesis occurs during early embryogenesis, there is a possibility of faulty differentiation of pluripotent stem cells and stem cell transcription factors playing a role in WT pathogenesis. In this regard, we performed molecular analysis to study the penetrance of WTI and WTII mutation in the specific population using polymerase chain reaction (PCR) based method in n=20 WT cases. Interestingly, both WTI and WTII gene were found to be mutated in about 15% of WT cases with a significance level of $p<0.05$ when compared against control samples of the same age group.

Rejuvenation of the immune system by adoptive cell therapy and chemotherapy in highly aggressive murine lymphoma

Uttam Gupta

Department of Zoology,
Banaras Hindu University, Varanasi.

The mainstays of standard cancer therapeutic strategies are chemotherapy, radiation therapy and surgery. The side effects of these therapies causes transient immune suppression which in turn increases the risk of infection and it also decreases the immune system's ability to inhibit further development of cancer. Here we have rejuvenated the immune system in experimental lymphoma via combined therapeutic regimen of cellular immunotherapy and chemotherapy. We have designed a novel immunotherapy based on dendritic cells (DC) and natural killer (NK) cells infusion against a murine tumor model called, Dalton's lymphoma. The therapeutic procedure was designed to overcome the resistance in tumor microenvironment, exhibiting immunosuppressive properties. NK cells and DC were isolated from spleen of naïve animals and were mixed in combinations followed by treatment with interleukin-15 (IL-15). The activated cellular combinations were infused in tumor bearing animals undergoing therapies with doxorubicin. Low dose chemotherapy in association with DC-NK therapy was delivered periodically in tumor bearing animals. Cell therapy plus chemotherapy significantly reduced tumor load accompanied with increased survival of the tumor bearing mice. IL-15 activation substantially improved antitumor functions of DC and NK either alone or in combination as judged by enhanced growth inhibition (MTT assay) and cytotoxicity (LDH release assay) against the tumor cells. Anti-tumor functions of DC in cooperation with NK cells following chemotherapy with Doxorubicin was remarkably enhanced in the murine lymphoma model.

EMT repression by retinoblastoma protein.

Keya Katare
GROW Research Lab
Narayana Nethralaya, Bangalore

Retinoblastoma is a paediatric malignancy of the retina, occurring due to the disruption of the tumour suppressor gene Retinoblastoma, RB1. Tumours that advance to group C and later stages, form metastatic vitreous seeds which infiltrate the optic nerve and into the sub-arachnoid space, initiating secondary tumours. EMT is an established process by which cancer cells acquire migratory and invasive capacities to colonize distant locations. This study shows that the overexpression of the gene RB1 in RB1 null WERI-RB1 cell line not only drives the downregulation of many pro-mitotic proteins such as E2F1, E2F2, CDk1, Cyclin E and c-Myc but also causes reduction in the levels of the widely reported EMT markers viz α-SMA, Twist, Snail, N-cadherin and phosphorylated β-catenin at the mRNA and protein level. Snail and Twist are transcription factors and master regulators of EMT initiation. Both the transcription factors act to downregulate cell adhesion molecules like E-cadherin, claudins and occludins which act to strengthen the cell to cell adhesion in epithelial cells. Twist upregulates N-cadherin which unlike E-cadherin has weaker binding with adjacent epithelial cell, also mediates signalling between PDGF and FGFR to the cell cytoskeleton, promoting mesenchymal state. Apart from signalling mediators such as PDGF and FGFR, TGFβ1 leads to epithelial plasticity, that may progress to an EMT, a prerequisite for cancer cell disseminationn and invasion. However, RB1 does not produce any differential expression of TGF-BRI and TGF-BRII, receptors along with other TGFβ superfamily members such as BMP4 and BMP7, suggesting alternate routes of EMT induction in retinoblastoma. Consistent with downregulation of mesenchymal transition markers, E-Cadherin, an adhesion molecule expressed in epithelial cells, related to cancer suppression, was up-regulated. Reduction in phosphorylation of β-catenin after RB1 overexpression suggests re-sequestration of β-catenin by E-cadherin, as total B-catenin remains the same. The above findings point out the extensive signalling circuitry falling under the Rb protein as a tumour suppressor gene that not only runs the central cell cycle machinery but also shapes the plastic fate of the cells.

Primary orbital yolk sac tumor

Dr. Etisha Rajput
Department of Radiation Oncology
Govt. Medical College, Nagpur

Yolk sac tumor (YST) (endodermal sinus tumor) is a common malignancy occurring in the gonads. Primordial germ cells migrate from yolk sac to genital ridge. Rarely due to aberrant migration, ectopic primitive germ cell or defect in embryogenesis can it occur in sites like uterus, vagina, liver, prostrate and head & neck. Extra gonadal germ cell tumor of the head and neck comprise only 5% of benign and malignant germ cell tumors, with yolk sac tumor being the most common histopathological subtype. Primary yolk sac tumor (YST) of orbit is rare and only few cases have been reported in the literature. Its clinical presentation may mimic many common pediatric orbital conditions, and delay in diagnosis affects ocular morbidity and mortality. A 2 year old, male child presented to our OPD with complaints of complete loss of vision and progressively increasing gross proptosis of right eye since 2 months. Initial diagnosis of malignant round cell tumor of eye was made on biopsy. Magnetic resonance imaging (MRI) of the head showed lesion in extraconal compartment of right orbit with small intraconal component. However with further work up, diagnosis of primary orbital yolk sac was confirmed with immunohistochemistry(IHC) and raised alpha-feto protein levels(>1210 ng/ml). No other 'primary tumor' or metastasis was detected by imaging of brain, abdomen, and chest. A treatment plan comprising of 6 cycles neoadjuvant chemotherapy (NACT) followed by debulking surgery was made. Patient has received 3 cycles of NACT(comprising of etoposide and cisplatin) every 21 days and had an excellent response both radiologically and cosmetically. Orbit is a rare primary site for yolk sac tumors. It more commonly affects females with a male:female ratio of 1:1.5 . Diagnosis between rhabdomyosarcoma and yolk sac tumor is challenging in orbital tumors. For the diagnosis of latter, immunohistochemistry and alpha fetoprotein levels are helpful. Both computed tomography (CT) and MRI can be used to determine the size, location, and extent of the lesion.

Roma Joglekar / Physiotherapist

Do you take care of your financial health?

While you focus on delivering quality care for people, we focus on delivering quality care for your finances. Ensuring you get the most out of your money, we work with single-minded focus towards finding you the best investment solutions. Our products range from **Mutual Funds, Fixed Deposits & Bonds, Insurance, PMS, AIF, Market Linked Debentures, Housing Loan, Loan against Property, Loan against shares/MF, SME & Corporate Lending to Formation of trust, Will Drafting, and Succession Planning.**

So, connect with us and achieve your ambitions of building a strong financial future.

Wealth Management

Aditya Birla Finance Limited

ADITYA BIRLA CAPITAL

PROTECTING INVESTING FINANCING ADVISING

adityabirlacapital.com

strand

Be the next change maker!

Be the part of complete onco-diagnostic solution at Strand Life Sciences

- Strand Germline Cancer Panel
- Strand Somatic Cancer Panel
- Strand Liquid Biopsy Test
- Strand HLA High Resolution Typing
- Strand Genetic Counselling

Hematology & Biochemistry

Histopathology

NGS & Molecular Pathology

Flow Cytometry

Cytogenetics & FISH

Microbiology

strand
Strand Life Sciences Pvt. Ltd
5th Floor, Kirloskar Business Park, Bellary Road, Hebbal, Bangalore 560024
Phone:1800-1022-695 Fax: +91-80-4078-7299, www.strandls.com

CAP ACCREDITED
COLLEGE of AMERICAN PATHOLOGISTS

MEDCONNECT

RIGHT DIAGNOSIS, RIGHT TREATMENT

METROPOLIS
The Pathology Specialist

Blood Tests | Diagnostics | Wellness

ONCOMET

One point Solution of Conclusive, Cost Effective & Quick Diagnosis for all Oncology tests

- URINARY TRACT PATHOLOGY
- SERUM TUMOUR MARKER
- GASTRO-INTESTINAL PATHOLOGY
- BREAST PATHOLOGY
- LUNG PATHOLOGY
- HEMATO-LYMPHOID PATHOLOGY
- GENETIC TESTS
- NEURO-PATHOLOGY

ONCOMET EXPERTISE

- Experience of handling over 2,00,000 Oncology Specimens annually for a decade
- Expertise of a pool of eminent Panelist & OncoPathologist
- Comprehensive capabilities right from Morphology to Molecular Oncology
- Innovative Menu of 450+ specialized tests

For more scientific insights write to us at medconnect@metropolisindia.com

For more details visit us at www.metropolisindia.com | Join us on MetropolisLab and MetropolisLab

Accreditations

CAP
COLLEGE of AMERICAN PATHOLOGISTS

NABL
(MC-2139)

BLOOD TESTS • DIAGNOSTICS • WELLNESS

India | South Asia | Africa | Middle East

SPONSORS

METROPOLIS
The Pathology Specialist

Roche

CUSTOMBIOTECH

Taylor & Francis Group
an informa business

strand
New Generation Healthcare

ALLIED
SCIENTIFIC PRO™

MITRA BIOTECH ™

Wealth Management
Aditya Birla Finance Ltd.

ADITYA BIRLA
CAPITAL

KSB
Nutritional Supplement

SURGIPLUS
Facilitating Healing

Infinity2Infinity
I2I