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Abstracts - Poster Presentations

PP 1: Identification of new potential biomarkers for cancer: making best use of available transcriptomics data

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The efficiency of biomarker discovery was supposed to increase with the advent of 'genome-wide expression profiling' techniques, particularly the microarray technology. But variations in results across experiments have become obstacles and hence, the pace of translational research has not been as per expectations. While the next generation sequencing technology now offers better hopes, most of the existing transcriptomics data need not be neglected. We developed a promising new algorithm and a database (MGEx-Tdb: http://resource.ibab.ac.in/MGEx-Tdb/) to make the best use of existing data for identifying new biomarkers for various diseases, by addressing one tissue at a time (BMC Genomics [2011] 11: 467). The new computational process helps to differentiate genes with higher reliability of expression pattern from the others. The approach involved manual extraction (biocuration) of most available microarray data sets, developing of a new database and deriving a 'consensus' expression status for each gene by using data across multiple 'comparable' studies (i.e., addressing same location and condition). Microarray experiments have now been conducted with clinical samples to validate the consensus expression status and their 'reliability scores'. A strong correlation was found between the reliability scores and the reproducibility of the same. A comparative in silico analysis confirmed that the database is more informative and easier to use than any other bioinformatics resources routinely used by scientists. We have further improved the efficiency of the database by revising the algorithm: a new scoring method developed by Shodhaka has been adopted to assess the reliability of gene expression status. The method not only improves microarray-based reliability scoring, but also allows incorporation of EST and other types of gene expression data. The new database and associated software can serve as a very potent 'platform for gene expression prediction and biomarker discovery' for any condition related to the testis tissue. It permits identification of genes consistently reported to be present or absent in disease conditions, but well established to have the opposite expression status in the normal tissue. Currently a list of genes co-expressed in the context of testicular cancer have been marked as targets for further research in diagnostics, prognostics and therapeutics, and being analyzed at the level of system biology and transcriptional regulation. The strategy can be adopted for any other tissue and disease. The new approach is also being used to identify more dependable potential biomarkers for cervical cancer. Similar work has also been initiated in the context of cancer associated with liver and prostate.

PP 2: Presence of *candida* and its subspecies in oral submucous fibrosis and p53 expression

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Oral submucous fibrosis is a chronic, progressive, scarring disease that affects people of South–East Asia predominantly. It is a precancerous condition with significantly increased risk of cancer. Candida albicans is present as normal flora in the oral cavity in abundant amount. In cases of oral submucous fibrosis, the epithelium gets altered and due to this it is postulated that there is alteration in the *Candidal* adhesion to the affected mucosa. p53 expression in oral submucous fibrosis was evaluated and correlation if any was elicited among Candida subspecies and p53 expression. Thus in this study we have carried out a qualitative and quantitative analysis of candida and its subspecies along with p53 expression in OSMF. A total number of 20 diagnosed cases of oral submucous fibrosis were included. The samples for mycological examination were obtained using sterile cotton swab from lesion surface. Samples were inoculated in Sabourad dextrose agar medium. For the subspecies identification, growth or Chromagar were analyzed along with sugar assimilation. Biopsy were taken for the same patients and subjected to IHC staining for p53. The study is in progress. The expected results are: There is increase in p53 expression in OSMF as compared to normal mucosa. There is decrease in *Candidal* count in OSMF.

PP 3: Associations between HPV and bronchogenic carcinoma

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Bronchogenic carcinoma is the most frequently diagnosed cancer worldwide. Its incidence in India appears to be on the rise. Even though smoking is the most important contributory factor in the causation of lung cancer, it is increasingly being recognized that never-smokers can be afflicted with non small cell carcinoma. Several etiologic factors including exposure to radon, cooking fumes, asbestos, heavy metals, environmental tobacco smoke, human papilloma virus (HPV) infection, and inherited genetic susceptibility have been proposed for the development of lung cancer in never smokers (LCINS). Following infection by HPV type 16, the E6 protein of this virus binds to p53 protein and interferes with cell cycle regulation resulting in abnormal cell proliferation and tumor growth. Among the 4508 cases in 53 published studies which were assessed for HPV by PCR analysis, the association between HPV and lung cancer was 25%. A wide variation in HPV prevalence in lung cancer (frequencies ranging from 4-18% in the west and 30-79% in the east) suggests either geographic and/or ethnic variation or variability due to protocols and primers/probes used by different laboratories. In the present study, we evaluated the association between HPV and bronchogenic carcinoma in 20 histologically proven non small cell lung cancer. HPV analysis was performed by polymerase chain reaction using primer targeting the E6 region of HPV type 16. Out of total 20 patients evaluated, 6 (30%) showed HPV positivity by E6 primer of HPV type 16. This accounts for a prevalence of 30%. The majority of the positive patients were male (5) and most had a history of being exposed to cigarette smoker (5). The most common histological subtype was adenocarcinoma (3) followed by squamous cell carcinoma (2). One patient had poorly differentiated carcinoma. In a small subset of patients selected at random from our cohort of NSCLC, we observed a 30% prevalence of HPV subtype 16. A larger study is however required to assess this somewhat high association of HPV with non small cell lung cancer. In the era of successful vaccine development to HPV 16 and 18, confirming the causality of this association could have profound implications on the therapy of NSCLC.

PP 4: Role of ayurveda and yoga in prevention of cancer and management of cancer

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Swaasthasya Swaasthyarakshanam Aathurasya Rogaprashamanam From Ayurvedic perspective, Cancer is the result of the body's reaction against the natural balance of the body. This concept is termed as "Pratyahara" in Ayurveda. Ayurveda suggests that individuals should follow "Swasth Vrita" which means "healthy circle". This is inclusive of following seasonal and regular routines that takes into consideration physical, mental and emotional aspects of humans making way to perfect health. Ayurvedic anti-oxidants such as turmeric, Ashwagandha, Amla, Neem, Triphala, Bacopa monnieri, Tinospora cordifolia and Gingko biloba have plenty of useful antioxidants which help in protecting the body from damage due to oxidation. The main sources of dietary antioxidants are vegetables and fruits which contains thousands of bioflavonoids and carotenes. It is recommended that atleast five portions of fruits and vegetables should be consumed in a day. Studies show that the incidence of cancer among individuals who do not eat veggies and fruits are double in comparison to those who make it as a part of their regular diet. Yoga as a way of life, including diet and lifestyle as well as Yogasanas, pranayama and meditation, seems able to impact cancer in many different ways. Cases of patients going into long-term remission from cancer are well known, many apparently stimulated by Yoga practice. This oral/poster presentation considers a simple extension of the genomic model of disease to include epigenetic phenomena, in terms of which Ayurveda and Yoga's benefits to diseases of all kinds, including cancer, may be understood. Yoga has the ability to reverse epigenetic changes explains its efficacy against chronic diseases. Holistic Yoga treatment may reduce the chances of carcinogenesis. Detailed insights into effects of holistic Yoga therapies on specific mechanisms of cancer generation should provide understanding of Yoga's potential contribution to cancer prevention and remission. They can be used to strengthen. All our attempts at decreasing the incidence & improving the efficacy of cancer have failed. Ayurveda has been long emphasizing the positive impact of exercise in promoting good health. Research conducted in western countries shows that physical exercise has the ability to kill emerging cancerous cells naturally. Yoga health maintenance and restoration programs, which should be widely, instituted as a lifestyle modification & public health initiatives in curbing the increasing levels of cancer incidence. Also performing breathing exercises like Pranayama and Yoga postures, help the individuals in dealing with cancer in a calm manner. Maintaining a healthy immune system is vital to fight the cancerous cells arising in the body. As stress weakens the immune system, yoga and meditation are recommended to alleviate stress. The principles adopted by Ayurveda towards health and the preventive measures adopted in dealing with cancer and such innumerable life threatening diseases show that one can play a critical role in enhancing one's own state of well-being. Ayurvedic therapies have stood the test of time and since time immemorial been used for various ailments. Indian subcontinent is the treasure house of numerous plants and medicinal properties have been assigned to several thousands. There are two aspects of usage of ayurvedic therapies one that uses the age old remedies in its original formulations while the other which is trying to decipher the molecular aspects of these drugs. Recently there is renewed interest in use of various ayurvedic drugs for oral and dental health. This presentation also highlights some aspect of the study of radioprotective effect of Tinosporacordifolia on patients on radiotherapy for Head & Neck Cancers.

PP 5: Analysis of non-synonymous single-nucleotide polymorphisms of casp9 gene associated with osteoporosis

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Osteoporosis is a skeletal disorder associated with progressive deterioration of bone due to alteration in bone remodeling process where there is a continuous bone resorption by osteoclasts followed by formation of new bone by osteoblasts. In this process both the survival and apoptosis of bone cells are important. CASP9 (Caspase 9), an apoptosis effector enzyme regulate the apoptosis of osteoclasts. Polymorphism in this gene may be critical, causing an imbalance in bone remodeling process. Association of single nucleotide polymorphisms (SNPs) with osteoporosis have been implicated with molecular genetics studies. Our present study includes the analysis of non synonymous single nucleotide polymorphisms (nsSNPs) of CASP9 gene to understand its role in relation to bone morphogenesis and osteoporosis. From our investigation of 941 SNPs, four nsSNPs are found to have significant damaging effects as predicted by all bioinformatics tools used in the analysis. The amino acid change found for two nsSNPs, rs2308941 and rs4646008 is from (Threonine to Isoleucine) and (Serine to Leucine), respectively, i.e., from hydrophilic to hydrophobic residues. For other two nsSNPs, rs1052574 and rs2308950, amino acid change is from (Leucine to Proline) and (Arginine to Histidine), respectively, i.e., from acyclic to 5-membered cyclic residues. Hence, the complete change in polarity and structure of the amino acid residues brought about by these mutations, respectively, can alter the structure and function of the protein. Our results obtained might be a good approach to identify the genetic risk factors for osteoporosis associated with CASP9 gene.

PP 6: Mushrooms- A promising functional food

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Traditional folk medicine and ethano-pharmacology coupled to bioprospecting have been an important source of many anticancer agents as well as other medicines. With the current decline in the number of new molecular entities from the pharmaceutical industry, novel anticancer agents are being sought from traditional medicine. Purified bioactive compounds derived from medicinal mushrooms are a potentially important new source of anticancer agents. Four mushroom samples were tested for mutagenic and anticancer activity. The four studied mushroom samples exhibited excellent anticancer activity. Mushrooms, therefore holds on the functionality for cure and prevention of cancer.

PP 7: *In silico* investigation and docking simulations of Cag A of Helicobacter pylori: A rational drug design for gastroduodenal cancer

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Helicobacter pylori is a notorious human and veterinary pathogen responsible for Gastroduodenal cancer due to the epithelial cell signaling mediated by Cytotoxin-Associated Gene A (Cag A). The 3D structure of Cag A is not yet known, such information are crucial for understanding the drug binding mechanism and development of novel agonists. In this study we modeled a 3D structure of Cag A protein by X-ray crystal structure of Dihydroorotate Dehydrogenase (PDB ID 2B4G: A) of Trypanosoma brucii as the template. The RMSD value of modeled structure was found to be 1.2 A^{o} and steriochemical validation shows 89. 5%, almost all residues are allowed region of Ramchandran plot. Further validation was done by various molecular dynamic emperical force fields. Overall quality factor of model identified to be 93.06; error values of individual residue are negligible. Molecular docking was performed to design and optimize new potential drugs against the disease by in silico approach. Our study concluded that plant alkaloids such as Navelbine, Taxotere, Taxol and Vinblastin are better drugs than antibiotics as it shows better binding energy with the modeled protein. As the best, Navelbine could be used as suitable drug of choice against gastroduodenal cancer.

PP 8: An adaptive edge preserved denoising and contrast enhancement for early detection of carcinoma

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The important signs of abnormalities in the cancer images are the suspicious region with irregular areas of increased density, area of skin thickening, clusters of small calcification. These diagnostic features are identified easily if the image quality is good. The challenging issues in an image acquired from a medical imaging modality like CT, MRI, mammography, Ultrasound images are how to suppress the noise by retaining the minute details and how to improve the precision of an image which will help for diagnosis. In this paper, we propose a new image enhancement technique namely Adaptive Edge Preserved Noise Removal (AEPNR) , to remove the different types of noise present in the input images and to enhance the edges for identifying the fine details present in the given image. It is a combination of low pass and high pass filter and enhancement is done using Contrast Limited Adaptive Histogram Equalization (CLAHE). The quantitative and qualitative performance is analyzed by taking images from standard database, compared the results with the already existing methods and has been proved that our method has higher performance.

PP 9: Differential expression and methylation of maspin gene in various cancers suggest its potential role in carcinogenesis

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Maspin is a member of the serpin (serine protease inhibitor) family and was reported as a tumor suppressor gene in breast and prostatic cancer. Maspin expression in normal cells is regulated by epigenetic modification in a cell type specific manner and its tissue specific expression is closely associated with DNA methylation. The epigenetic deregulation frequently participates in tumorigenesis by inactivation of tumor suppressor genes, and the association of promoter hypermethylation and gene silencing is an established oncogenic process in cancer. This investigation aimed to describe the role of tissue specific maspin expression in various cancers and its value as a prognostic indicator. The Medline (via PubMed), Google Scholar and Scirus databases were searched using the subject keywords maspin expression and its epigenetic regulation. We aimed to analyze the role of maspin gene expression in various cancers and its importance as a prognostic indicator. Various studies showed that promoter methylation of the maspin gene leads to gene silencing in cancers, such as breast, thyroid, skin, and colon. Maspin-positive cells (mammary/prostatic epithelia and skin/oral keratinocytes) showed no methylation at the CpG islands of the promoter region. In contrast, maspin-negative cells (skin fibroblasts, lymphocytes, heart, liver, and bone marrow) showed extensive methylation. Aberrant expression of maspin protein related to DNA hypomethylation in the promoter region is frequently observed in pancreatic and gallbladder carcinoma, whereas the non tumorous gallbladder epithelium is maspin negative. Over expression was observed in pancreatic, gallbladder and ovarian cancer, whereas normal tissue was maspin negative. Precancerous lesions also express maspin protein and its regulation is correlated with malignant behavior. In these tumors maspin seems to behave as an oncogene rather than a tumor suppressor gene. This suggests maspin gene as a potential prognostic marker to be studied.

PP 10: Colorimetric determination of magnesium in blood and saliva in oral squamous cell carcinoma

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Colorimetric Determination of Magnesium in blood and saliva in oral squamous cell carcinoma. Magnesium is one of the most abundant cations present in living cells. It is an essential mineral that is needed for a broad variety of physiological functions. Magnesium is considered the physiological calcium antagonist. At a cellular level, it may act as an important regulator of cell functions. Its serum concentration is remarkably constant in healthy subjects. High normal Mg serum concentrations are protective against various diseases. Imbalances in magnesium metabolism are common and are associated with different pathological conditions. Magnesium level will be reduced in saliva and blood in oral squamous cell carcinoma patient. Conclusion will be stated on the results observed.

PP 11: A study on the effect of diethylnitrosamine on liver mitochondrial membrane lipids

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The past decade has revealed a new role for the mitochondria in cell metabolism, that is, in the regulation of cell death pathways. Considering that most tumor cells are resistant to apoptosis, one might question whether such resistance is related to the particular properties of mitochondria in cancer cells that are distinct from those of mitochondria in non-malignant cells. Our objective is to study the lipid organization in liver mitochondrial membrane in mice after exposure to Diethylnitrosamine(DEN). This study is likely to provide an early detection and new target for cancer treatment. We were working towards this goal by cancer induction, mitochondria isolation and extraction and purification of lipids. The achievements that we had made so far are: we have been able to successfully induce carcinogenesis in Swiss albino mice by a calculated weekly dose of DEN and the morphological changes in the liver of both sham-treated mice as well as DEN-treated mice was distinctly observed. The marker enzyme assays of γ-glutamyl transpeptidase (GGT) and Acetylcholine esterase (Ache) were assayed which showed successful cancer induction. We have also been able to successfully isolate liver mitochondria in mice treated with diethylnitrosamine as well as sham-treated mice. Microscopic studies of the isolated mitochondria had been done. We have also been able to successfully extract the liver mitochondrial lipids and to separate them via thin layer chromatography (TLC). The total lipid concentration of both sham-treated as well as DEN-treated mitochondria had been calculated.

PP 12: Para-phenylenediamine treated rat exhibited lymphoproliferative disorder consistent with chronic lymphocytic leukemia and splenic B-cell lymphoma

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Hair colouring products are widely used and are known to contain components that are mutagenic and carcinogenic. Epidemiological studies have identified an association between occupational exposures to hair colouring products and hematopoietic cancer mostly chronic lymphocytic leukemia and Non Hodgkin lymphoma. Although many of these compounds have been banned from utilization, still a few are found to be extensively used in semi permanent and permanent hair colouring products. Para-phenylenediamine, a new generation aromatic amine is found in almost every hair colouring formulation available in the market in varying proportion. *In vitro* studies suggest the genotoxic potential of para-phenylenediamine, which may be accounted for subsequent development of different forms of blood cancers in long term exposed human subjects. In the present investigation, an experimental set up have been utilized for the safety evaluation of para-phenylenediamine in rat model. In this sub chronic exposure model, rats were exposed topically to either double distilled water or aqueous solution of para-phenylenediamine (0, 1, 2 &

3 mg/Kg) for ninety days. After that animals were sacrificed and blood was collected for analysis. Peripheral blood pictures of the treated rats exhibited significant leucocytosis with lymphocytosis, thrombocytopenia, and significant percentage of smudge cells as well as villous lymphocytes. Bone marrow smears exhibited predominant lymphocytes infiltration with typical B-cell phenotypes. Spleenic histology revealed expanded germinal follicles consistent with spleenic lymphoma as reported in clinical studies. Overall results indicated a trend towards hematopoietic malignancies in the para-phenylenediamine treated rats.

PP 13: Abrus agglutinin induces both and intrinsic and extrinsic apoptosis in human breast cancer cells

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Abrus agglutinin (AAG), isolated from the seeds of Abrus precatorius is a hetero-tetrameric glycoprotein of 134-kDa molecular weight, composed of two A and two B chains linked through disulphide bridges. The lectin has specificity towards [gal (β1 → 3) galNAc] and belongs to type II ribosome inactivating protein family (RIP II) with a protein synthesis inhibitory concentration (IC50) of 0.469 μg/ml and a lethal dose (LD50) 5 mg/kg body weight in mice. In addition, it induces mitochondrial dependent apoptosis followed by inhibition of protein synthesis. In this study, we have investigated *in vitro* growth inhibitory potential of AGG and its molecular mechanism in human breast cancer model. The result showed that AGG was able to decrease the cell viability of human breast cancer cell line in a dose depended manner. Further, Annexin V and PI staining demonstrated that AGG induced apoptosis after 24 h treatment in breast cancer cells. A dose-dependent colony-forming inhibition effect was observed in presence AGG indicating long-term survival nature of AGG in breast cancer cells. The Western blot analysis showed that AGG enhanced activation of PARP, caspase-3, caspase-9 and decrease in expression of anti-apoptotic proteins including Bcl_2 and Bcl-xL. Additionally, AGG caused cleavage of Bax involving increasing the cytotoxic properties of this proapoptotic molecule. An enhanced ROS production and decreased mitochondrial membrane potential was observed with increasing the concentration of AGG in breast cancer cells. We then investigated whether AGG induced extrinsic pathway mediated apoptosis and the result showed that AGG showed increase in activation of caspase-8. Further, it increased the expression of FADD and Fas-L confirming the role of AGG in extrinsic apoptosis. As AGG induces ROS mediated mitochondrial apoptosis, we deciphered the role of ROS in extrinsic pathway, and the result showed that inhibition of ROS by NAC decrease in activation of caspase-8 indicating extrinsic pathway was mediated through ROS generation.

PP 14: Rapid experimental protocol to distinguish between oral cancer and precancerous lesion

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Development of rapid experimental protocol to determine the progression of lesion towards malignancy by DNA quantification. Advances in medicine usually are made in halting steps with novel ideas preceding their realization through some advances that then need to be verified in practice. Even after they are verified, we constantly seek redefinition of subsets with practical and therapeutic advantages. It is a well known fact that with progression of malignancy there is decrease in cellular adhesion, increase in cellular proliferation and increase in DNA content of affected cells. So taking these factors into consideration we have devised a rapid experimental protocol which could be of use in future in distinguishing between normal, pre-malignant and malignant lesions. Conclusion will be stated as per the results observed.

PP 15: Evaluation of *in vitro* cytotoxicity of Citrus reticulate essential oil against HT-29 cell lines

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The study was designed to determine to evaluate the cytotoxic activity of essential oil of Citrus reticulata. The essential oil was prepared using Clevenger type apparatus. HT-29 cells were cultured in the presence of oil at various concentrations (10,20and 30μl/ml) for 48hrs, and the percentage of cell viability was calculated by using MTT Assay. Results indicate that essential oil has great potential against human colon cell lines. Thus the essential oil possesses *in vitro* cytotoxicity against HT-29 cell lines. The essential oil seems promising for the development of a phytomedicine for Colon Cancer.

PP 16: Polyhydroxybutyrate microspheres for the oral delivery of 5-fluorouracil

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Biocompatible and biodegradable polymers belonging to polyhydroxyalkanoates have been used for the delivery of a variety of drugs to overcome associated problems such as frequent drug administration, lesser biological half life and toxicity. In the present study, polyhydroxybutyrate (PHB) microspheres were prepared by solvent evaporation technique for the oral delivery of 5-Fluorouracil (5-FU) an anticancer drug. Three different formulations were prepared with different percent loading of 5-FU and by varying other processing parameters such as speed of stirring and polymer-solvent ratio. The morphology and topology of the prepared PHB microspheres were studied using Scanning Electron Microscopy (SEM) and results indicated that the formed microspheres were spherical in shape with rugged surface and small quantity of polymer debris adhered to the surfaces of microspheres. Fourier Transform Infrared (FTIR) spectral studies were done to confirm the absence of drug-polymer interactions. Differential Scanning Calorimetry (DSC) studies were carried out on blank as well as drug loaded PHB microspheres to study the crystallinity of the drug after encapsulation. Average particle size of the microspheres was in the range of 80-150 μm. Results of percent drug loading were found to be in the range from 10 to 34% and loading efficiency were found to be in the range from 24 to 67.5%. The *in vitro* drug release studies were performed in pH 1.2 buffer followed by phosphate buffer pH 7.4 to study the release behavior of the microspheres all along the gastrointestinal tract. From the present findings it is demonstrated that PHB microspheres could be a promising candidate for oral delivery of anticancer drugs.

PP 17: 15-Lipoxygenase-1 has tumor suppressive properties in colorectal carcinogenesis

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15-lipoxygenase-1(15-LO-1), a member of the inflammatory eicosanoid pathway, oxidatively metabolizes linoleic acid and its expression is repressed in colorectal cancer (CRC). In this study, we investigated the hypothesis that the lack of 15-LO-1 expression in CRC cells may contribute to tumorigenesis. Therefore we have introduced 15-LO-1 in HCT-116 and HT-29 cells that do not have detectable levels of 15-LO-1. Our data indicate that expression of 15-LO-1 significantly decreased cell proliferation and

increased apoptosis. In addition, we observed a reduction in adhesion to fibronectin, anchorage independent growth on soft agar, cellular motility and ability to heal a scratch wound and migratory and invasive capacity across Matrigel. 15-LO-1 expression also reduced the expression of MTA-1 protein, a part of the NuRD silencing complex. Mechanistically, the anti-tumorigenic property of 15-LO-1 was by inhibition of the anti-apoptotic inflammatory transcription factor nuclear factor kappa B (NF-κB). Ectopic expression of 15-LO-1 gene in CRC cell lines inhibited the degradation of inhibitor of kappa B (IκBα), decreased nuclear translocation of NF-κB subunits p65 and p50, decreased DNA binding in the nucleus and decreased transcriptional activity of NF-κB. The 15-LO-1 enzymatic product 13(S)-HODE is known to be a PPARgamma (PPARγ) agonist, and NF-κB can be inhibited by PPARγ. We have observed that the inhibition of both early and late stages of NF-κB activation could rescued by the PPARγ antagonist GW9662 indicating that the inhibition was most likely mediated via PPARγ. We therefore propose that 15-LO-1 has tumor suppressive properties and should be exploited for therapeutic benefits.

PP 18: Modulation of endogenous antioxidant defense system by curcumin down regulates expression of IL-1α, activation of NF-κB and inhibits carcinogenesis by attenuating oxidative stress

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Oxidative stress is one of the major contributors of carcinogenesis which induces a number of carcinogenic effects including genetic instability, alteration of gene expression, and increased protein instability. Interleukin-1α is a potent early proinflammatory cytokine that initiates a cascade of other cytokines, growth factors, etc., and also stimulates the production of reactive oxygen species (ROS). Further, the up regulation of Interleukin-1α contributes to inflammation, carcinogenesis and malignancy through activation of transcription factors like NF-κB etc. In the present study the activities and expression of antioxidant enzymes comprising endogenous antioxidant defense system as well as the expression of IL-1α and activation of NF-κB were compared in a murine T-cell lymphoma i.e. Dalton's Lymphoma (DL) bearing mice with reference to Normal (N) adult male mice of AKR strain. The anti-inflammatory role of curcumin was tested in DL mice. Up regulated expression of IL-1α, NF-κB activation and inflammation-mediated oxidative stress, were found to be down regulated in curcumin treated DL mice in comparison to DL mice. Further, curcumin modulated antioxidant defense system of DLT mice by elevating the expression and activities of antioxidant enzymes which were adversely affected in DL mice. Curcumin was also found to inhibit cell proliferation and cell viability. Thus the results reflect that IL-1α along with NF-κB may be regarded as the tumor promoter agent and could be the target for prevention of cancer. Thus curcumin is reported to have anti-carcinogenic potential as it down regulates tumor promoters IL-1a, NF-κB as well as oxidative stress by improving enzymatic antioxidant defense system.

PP 19: Case study on surviving cancer: both doctor's and patient's perspective

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In the present study, a survey was carried out by conducting interviews with different doctors and patient to understand more about cancer; it was observed that there is a high chance of survival if it is detected early and if the patient is able to go through the treatment. Interview with doctors like Dr. Appaji, Dr. Girish Rao, Dr. L. Vijay Bhaskar, Dr. Nirmala S., Dr. Ramananda Nadig from different hospital/Medical Institutes located in Bangalore region have enlightened us with various important facts about cancer and its treatment that should be made aware among the masses. The doctors emphasized on the fact that early detection of cancer helps a lot in the treatment. They also have expressed that cancer is not an incurable disease and that patients and family members should approach the treatment with positive attitude. They said that they have counseling programs for the patients to help them with the treatment. According to the doctors, patients are not supposed to take any alternate treatment when they are undergoing one. They have also highlighted the harmful effects of smoking, liquor consumption etc. and stated the fact that as long as people continue consumption of these types of substances, cancer will continue to prevail. According to the doctors people who consume these harmful substances are usually under social and economic stress. The survival stories of various patients also have provided everyone with a positive hope that cancer can be tackled. The patients express the fact that though they were disheartened upon hearing that they had cancer, they proceeded with the treatment with positive attitude and have undergone successful treatment. One case study shows that the patient was on stage 3A of multiple myeloma and the chemotherapy was making him very weak, he underwent stem cell treatment and has undergone successful treatment. For past 2 years, all checkup reports show no cancer report. This kind of survival story sets examples that cancer can be treated, if patient proceeds with positive hope. It removes all myths about cancer from the society and also makes the mass aware of the treatment available.

PP 20: Human papillomavirus in oral carcinogenesis

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This study was proposed to detect papillomavirus structural antigens in oral squamous cell carcinomas and in normal oral tissues.The peroxidase-anti-peroxidase method, which is an immunohistochemical staining method was used. Out of the 35 oral carcinomas examined, seven (20%) were found to be positive, while not even one of the 26 normal oral tissue specimens examined were positive. This statistically significant finding further substantiated the role of human papillomavirus (HPV) in oral carcinogenesis. HPV is also found to be associated with precancerous states and cervical cancers.

PP 21: Altered enzyme profiles in germinating seeds of Phaseolus radiatus (green gram) and Macrotyloma uniflorum (horsegram) in response to antimototic response to antibiotic compounds

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Anticancer drugs are capable of inhibiting seed germination as evidenced by previous studies. Based on observations made in this laboratory on the inhibition of germination in green gram by the cancer palliative herbal drug HST-K, developed by the Herbal Science Trust Bangalore we have sought to investigate the biochemical basis of this inhibition. The response of amylase, acid phosphatase and alkaline phosphatase in germinating green gram and horse gram seeds with respect to the HST-K drug and commercially used anticancer drugs- vincristine, vinblastine and cyclophosphamide is discussed. These enzymes were chosen because of their enhancement in seed germination and metastasis. One unit of drug activity was defined as the amount of drug producing a 1% reduction in specific activity of the enzyme relative to the control (absence of the drug). The HST-K drug (1:5 v/v stock-diluted) exhibited 77 ± 4 units, 70 ± 4 units and 65 ± 9 units inhibition against amylase, acid and alkaline phosphatases respectively, in green gram. In horse gram, HST-K displayed 90 ± 0.6 units, 99 ± 0.07 units and 90 ± 1.5 units against the same enzymes respectively. Moderate activity was displayed by the other drugs at the concentrations tested. Preliminary data gathered from patients administered with the HST-K drug indicated a reduction in serum amylase levels indicating that this palliative drug should also be explored for its clinical efficacy in early cancer treatment.

PP 22: Aberrant expression of CD117 and CD13 in precursor B cell acute lymphoblastic leukemia (pre-B ALL) patients of north east India

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Flow cytometric immunophenotyping remains an indispensable tool for the diagnosis, classification, staging, and monitoring of hematologic neoplasms. Phenotypically abnormal populations have been documented in many hematologic neoplasms, including lymphoma, chronic lymphoid leukemias, plasma cell neoplasms, acute leukemia, paroxysmal nocturnal hemoglobinuria, mast cell disease, myelodysplastic syndromes, and myeloproliferative disorders. In the current study samples were collected from patients who attended Dr. B. Borooah Cancer Institute for diagnosis. Thirty four cases of confirmed pre-B ALL were evaluated by flow cytometry based immunophenotyping for the presence of CD13 and CD117. We report aberrant myeloid expression of CD117 and CD13 in B-ALL cases. Out of the 34 cases, 9 (26.5%) were devoid of aberrant expression of CD117 and CD13 markers whereas the remaining 25 cases (73.5%) had shown expression of CD117. Of these 25 CD117 positive cases, 4 cases (11.7% of total) also showed weak co-expression of CD13. Among hematological malignancies, CD117 expression was initially associated with acute myeloblastic leukemia (AML). Nevertheless, it is now well established that it may also be found in a relatively important proportion of T-acute lymphoblastic leukemia (ALL) while it is usually absent in B-lineage ALL[1]. But a immunophenotypic study revealed the presence of high amounts of CD117 in the surface of the clonal B cell population. These markers signify a poor prognosis compared to ALL cases without myeloid antigens, and a poor response to drug therapies targeting conventional ALL. Future studies will be directed to correlation of these markers with prognosis and therapeutic response, as well as whether drug therapies targeting myeloid antigens could be of use in treatment[3]. To the best of our information, this is the first report from North-East India of immunophenotyping in B-ALL cases using flow cytometry. In future detailed studies will be needed to better understand the aberrant expression pattern of various CD markers among the patients of this region.

PP 23: Quantification of reactive nitrogen intermediate among patients with different forms of cancer

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Nitric oxide is a biological messenger that regulates physiological functions and participates in pathological processes. Reactive nitrogen species (RNS) are family of antimicrobial peptide molecules derived from nitric oxide (NO) and superoxide (O_2) produced via the enzymatic activity of inducible nitric oxide synthase 2(NOS_2) and NADPH oxidase respectively .NOS_2 is primarily in macrophages after induction by cytokines and microbial products, notably Interferon gamma and lipopolysccharides. Reactive nitrogen species act together with reactive oxygen species to damage cells causing nitrosactive stress. The high level of ROS/RNS induces distinct pathological consequence that greatly amplifies and propagates injury, leading to irreversible cell and tissue degeneration. A total of 50 cancer patient serum sample were collected 48 female cancer patient and 2 male cancer patient Reactive nitrogen intermediate of serum and urine was determined using Griess reagent by calorimetric method. The level of reactive nitrogen intermediate could be a biomarker for the functional property of macrophage mediated by cytokines which would lead to active involvement of the Immune system. The occurrence of nitrosative stress in cancer patient mainly due to the uncontrolled proliferation of cancerous cells and also occurrence of imbalance of the antioxidant enzymes leading to oxidative stress of the macrophage there by induces the higher level of reactive nitrogen species release which mediates toxicity. Proper therapeutic modulation might reduces the toxicity and promote effective therapeutic management. Results will be presented at the time of conference.

PP 24: Cyst: A immunohistochemical study

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CD105 antibody has shown a greater specificity for the tumor vasculature than pan-endothelial markers such as CD31, CD34 and Factor VIII. Assessment of angiogenesis immunohistochemically by using CD105 antibody emerged as a potential predictor of prognosis for several solid malignancies. The purpose of the present study was to evaluate the expression of CD-105 (tumor angiogenesis) in Ameloblastoma, Keratocystic odontogenic tumors (KCOT), Dentigerous cyst (DC) and Normal Oral Mucosa (NOM) by using monoclonal mouse anti-human antibody against CD105 (endoglin) antigen. The expression of CD-105 was assessed in paraffin embedded tissue of 28 Ameloblastoma, 36 KCOT, 28 DC, and 19 NOM by immunohistochemistry. The histomorphometric analysis was carried out to measure the Mean Vascular Density (MVD), Total Vascular Area (TVA) and Mean Vascular Area (MVA) in all the groups. The statistical analysis was carried out by using Mann–Whitney U-test, Kruskal–Wallis test, One-Way Analysis of Variance (ANOVA), independent student T test and Multiple comparisons using Post Hoc Bonferroni test. The level of statistical significance is at $P<0.05$. There was significant difference noted in MVD, TVA and MVA amongst Ameloblastoma, KCOT, DC and NOM. Non-significant difference of MVD was noted between Ameloblastoma and KCOT. TVA and MVA were significantly higher in Ameloblastoma than KCOT, NOM and DC. MVD, TVA and MVA were significantly higher in KCOT than NOM and DC. The MVD was significantly higher in KCOT and Ameloblastoma than DC and NOM. The MVD and TVA were significantly higher in NOM than DC. The result suggests that CD105 (endoglin) is strongly expressed in microvessels of Ameloblastoma and KCOT as compared to DC and NOM. Thus, it suggests that tumor angiogenesis may be associated with locally aggressive biologic behavior of odontogenic tumors. The angiogenesis could be a potent target for developing antiangiogenic therapeutic strategies in odontogenic tumors.

PP 25: Preparation and *in vitro* characterization of novel peg crosslinked chitosan microsphere for oral delivery of 5- fluorouracil

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PEG crosslinked chitosan has advantage over chitosan in terms of pH independent swelling properties and biocompatibility. In this study, a novel but simple method was developed for producing PEG crosslinked chitosan microspheres by emulsion crosslinking method. The polymer matrices were characterized by Fourier transform infrared (FTIR) spectroscopy to confirm the crosslinking between PEG and chitosan. The differential scanning calorimetry (DSC) analyses were done to confirm the crystallinity of the drug. Thermo gravimetric analyses (TGA) were carried out to confirm the thermal behavior and stability of plain as well as crosslinked polymer before and after crosslinking. The microspheres were loaded with different amounts of 5-fluorouracil (5 FU), an anticancer drug and were evaluated for % drug loading and loading efficiency. DSC studies were also carried out on 5 FU loaded microspheres to analyze the crystallinity of 5 FU after loading in PEG crosslinked chitosan. The surface morphology of microspheres was determined by scanning electron microscopy (SEM). The microspheres were

evaluated for particle size, swelling index and *in vitro* drug release studies. The produced microspheres showed a pH – independent swelling behavior. The microspheres swelled in both simulated stomach pH (1.2) and at intestinal pH (7.4). Thus, the present study indicates that PEG crosslinked chitosan microsphere could be a better delivery device for effective cancer therapy.

PP 26: Suppression of breast cancer by tumour suppressor and oncogene KLF4

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Kruppel-like factor 4 (KLF4), so named for its homology to the Drosophila melanogaster Kruppel protein, has been extensively studied for its roles in cell proliferation, differentiation and survival, especially in the context of cancer. Recently, KLF4 has also proven to be one of the four major factors that is involved in the induction of pluripotency. It is a transcription factor that participates in both tumor suppression and oncogenesis. To determine the association of KLF4 with tumorigenesis, scientists have integrated data assembled in the Oncomine database and discovered a decrease in KLF4 gene transcripts in breast cancers. Further analysis of the database showed a correlation between KLF4 expression and estrogen receptor-(ERα) positivity. Knockdown of KLF4 in MCF-7 cells elevated the growth rate of these cells in the presence of estrogen. Examination of the interaction between KLF4 and ERα indicated that KLF4 bound to the DNA-binding region of ERα. KLF4 thus inhibits the binding of ERα to estrogen response elements in promoter regions, resulting in a reduction in ERα target gene transcription thereby suppressing breast cancer. KLF4 is transcriptionally activated by p53 following DNA damage. It was shown that activation of p53 decreased the transcriptional activity of ERα by elevating KLF4 expression. The studies indicate a molecular network between p53, KLF4 and ERα. Since both p53 and ERα are involved in cell growth and apoptosis, these results may explain why KLF4 possesses both tumor suppressive and oncogenic functions in breast cancers.

PP 27: Comparison of natural beta carotene and vitamin e, vitamin c and minerals in the management of oral submucous fibrosis

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Oral submucous Fibrosis is a chronic, irreversible inflammatory premalignant condition of unknown etiology with a potential of 2-5% malignant transformation to frank carcinoma. The condition causes various symptoms ranging from burning sensation, inability to open the mouth, chewing, swallowing thereby causing debilitation. Etiology and pathogenesis is complex and unknown. There have been many factors associated with submucous fibrosis amongst which common products rich in arecoline and tobacco which are said to have been related to submucous fibrosis in India. Etiology is uncertain and therefore the treatment has been largely symptomatic. Basically prevention of oral submucous fibrosis is likely to prove more effective than treatment. This will focus on reducing exposure to the unknown risk factors, particularly use of the betel quid together with the correction of any nutritional deficiencies. Hence an attempt has been made to assess and influence of natural beta carotene and combination of beta carotene and other antioxidants along with local injection of hydrocortisone and hyaluronidase in reducing the clinical symptoms of burning, improvement of mouth opening and its effects on collagen. In this study, 50 patients have been selected with oral submucous fibrosis and grouped into 2 groups. In one group, injection hyaluronidase and hydrocortisone with natural beta carotene were given. In another group, only intra-lesional injection and multivitamins were given. Histopathology was carried out after regimen and results were evaluated. Results of the study show significant improvement in symptoms and reduction in thickness of collagen in natural beta carotene group when compared to the group on intra-lesional injections and vitamins. The details of the present study will be presented at the conference.

PP 28: Light energy leading to endocrine disorder

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Cancer is the dreadful disease of the present world. It has been observed that it is more prevailed upon civilized society .Long effort are being made for development of remedy for the disease .Parallel to cure prevention is also important .After some sample studies on some cancer patients it has been observed that light has some role upon Endocrine related cancer , e.g., Ovarian , Breast among ladies. During dark hours natural antioxidant, Melatonin hormone synthesizes. It can combat with the oxidative stress etc. Prolong oxidizing effect on our Endocrine system and in extreme case leads to cancer. Lack of generation of Melatonin hormone and its facility to combat with oxidative effect with the body likely are one of the causes of Endocrine disorder and leads to carcinogenic effect, e.g. Breast and Ovarian Cancer. Cytochromes spread through out the skin of our body are very sensitive to light. Blue light having low wavelength posses more energy and is capable of conversion of Ferrous to Ferric stage of Cytochromes which releases an electron to involve signal transmission to our brain, i.e., Pituitary Gland, seat of hormone secretion. The Cytochromes are synthesized at liver. It has been observed that there is a relation between prolong usage of Blue Light (in the spectrum of conventional Fluorescent lamp Blue is the predominant colour), disorder of liver/digestive system (synthesis of Cytochrome) leads to interrupt Melatonin secretion. Intrinsically photosensitive Retinal Ganglion Cells (ipRGC) are more sensitive to Blue Light. The natural cycle for synthesis of Melatonin hormone starts rising after the Sun set and it reaches its peak at about 12 O'clock at night , starts decreasing after that and diminishes after the Sun rise .Synthesis of Melatonin has been reported inhibited by Light .The synthesis cycle of Melatonin is just the opposite to Cortisol (stress) Hormone . Both the hormones are light dependent and Melatonin can combat the effect of the stress hormone - Cortisol. It easily been observed that educated people who undergoes stressful working environment and studied beyond 12 O'clock are more venerable to Endocrine disorders. Considering the present working conditions usage of artificial light for prolong period can not be stopped .Light with short wave length need to be changed to longer wave length (towards red colour), i.e., more towards golden colour calls for . Spectral analysis of the various coloured fluorescent lamps shows that till time Warm White Fluorescent lamp likely to be the optimum solution among the lamps available in Indian market. This work is likely to be a budding idea on the further studies on cancer prevention and awareness development among public.

PP 29: Chemical and hormonal induction of prostate cancer in rat model and chemoprevention by using Cassia senna (L)

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Cancer of the prostate is the most frequently diagnosed cancer and the second most frequent cause of death due to cancer in males in the USA and many west European countries. In India, prostate cancer ranks in its fifth incidence and 4th in mortality rate. In the present study the anticancer activity of ethanolic extract of Cassia senna (L) was evaluated against prostate carcinogenesis in male wistar rats. Induction of prostate carcinogenesis by intravenous injection of testosterone (100mg/kg bwt) and N-Methyl N-Nitroso Urea (MNU 50mg/kg bwt). Experimental rats were treated orally with ethanolic extract of Cassia senna (150mg/kg bwt) for duration of 4 months. Biochemical estimations such as Prostatic acid phosphatase, Lipid peroxidation, enzymic antioxidants and non enzymic

antioxidants were done in both prostate gland and seminal vesicle. The Prostatic acid phosphatase and lipid peroxidation levels were significantly increased whereas the enzymic and non enzymic antioxidants were significantly decreased in induced group. After treatment with C.senna extract they were reversed to near normal. Histopathological Examination Showed significant changes like hyperplastic prostatic acini and malignant proliferation of ductal epithelial cells in the prostate and seminal vesicle of Carcinogen induced rats. In the animals treated with C.senna extract normal flow dilated ducts and acini with regular epithelial lining were observed in prostate and partially hyperplastic and partially flattered epithelium in seminal vesicle were observed. In conclusion from these findings it is reported that the ethanolic extract of C.senna has good anticancer activity against Prostate carcinogenesis.

PP 30: Inhibitory potential of methanolic extracts of Aristolochia tagala, Curcuma caesia and Poulzolzia vimnea on hepatocellular carcinoma induced by diethylnitrosamine in BALB/C mice

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Cancer is a diverse class of disease which differs widely in its cause and biology in human beings. Because of this, it remains one of the most prominent killer diseases of humans across the globe accounting for over 13% of all human deaths. With increasing life expectancy, industrialization and changing life-style, the incidence of cancer is increasing exponentially. Therefore, effective therapeutic approach needs to be discovered urgently to combat the disease. Cancer is most commonly treated by radiotherapy, chemotherapy or both in combination. The current generation of chemotherapeutic agents is essentially synthetic manufactured drugs with undesirable side effects. Therefore, the need to find a natural, safe and effective herbal cure remains a major challenge to the scientific community. In recent times, attempts are being made to successfully use few phytochemicals in the mainstream cancer chemotherapy. However, the commercial plant-derived anticancer formulations represent only one-fourth of the total repertoire of the available treatment options. Biologically active plant-derived phytochemical formulations can be expected to play an increasingly significant role in the commercial development of new generation of drugs to combat the menace of cancer. In this, it is highly desirable that the perspective herbal formulations are tested in order to identify potential anticancer agents with minimal to nil toxicity to healthy tissues. In this study, the anticancer effects of methanolic extracts of Aristolochia tagala (local name: Kur thlong), Curcuma caesia (local name: Shyrmit iong) and Poulzolzia vimnea (local name: Kymbat pnah), herbal plants that have traditionally been used by community doctors in Meghalaya, have been evaluated. Balb/c Swiss albino mice were exposed to an established hepatocarcinogen, diethylnitrosamine (DEN) for up to 20 weeks. They were administered the methanolic plant extracts weekly by i.p. injection from 14 weeks until 20 weeks. The effects were followed on several cancer relevant parameters, which included marker enzyme acetylcholine esterase (AChE), besides superoxide dismutase (SOD) and catalase (CAT), two antioxidant enzymes involved in inactivation of carcinogen and direct elimination of toxin- free radicals and electrophiles. Histological examination of liver tissue damage was also made to evaluate the effects. AChE recorded significant changes when treated with Poulzolzia vimnea extract at doses of 250 and 500 mg/kg b.w. as well as Aristolochia tagala at a dose of 500 mg/kg b.w. when compared to untreated mice exposed to DEN. CAT showed significant changes when treated with Poulzolzia vimnea extract at 250 mg/kg b.w. dose while SOD showed significant changes when treated with Poulzolzia vimnea extract at doses 250 and 500 mg/kg b.w, Curcuma caesia extract at 500 mg/kg b.w. and Aristolochia tagala at 500 mg/kg b.w. Morphological and histological examinations of liver tissues showed cell distortion and necrosis when exposed to the carcinogen but regular cell morphology was retained in those treated with the plant extracts. The presentation shall discuss possible implication of these results in treatment and management of cancer.

PP 31: Prevalence of human papillomavirus in oral mucosa is low in India (eastern Uttar Pradesh)

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HPV belongs to a family of tumorigenic viruses and induces cutaneous and mucosal proliferation of epithelial cells. There is abundant epidemiologic and virologic evidence that high-risk Human Papillomavirus (HPVs) are tumorigenic in human epithelia, particularly in the cervix, but HPV DNA has been also detected in head and neck squamous cell carcinomas (HNSCC). However presence of the virus in tumor specimens does not implies any causal relationship. Epidemiologic studies have found that exposure to HPV increases risk of HNSCC, and HPV infection may interact with alcohol and tobacco exposure in tumor promotion. Molecular studies indicate that transcriptionally active virus is confined to tumor cells. In this study prevalence of HPV in oral mucosa of human samples was investigated. A total of 67 cancerous, 61 normal controls and 25 precancerous samples were studied for the presence of HPV in human samples. DNA was extracted from the all the samples with modified protocol. Presence of HPV in DNA samples was detected by PCR using consensus primer pairs. Only 20 samples and maximum from the benign and cancerous found positive. Normal controls have not shown any positive HPV DNA. Though low prevalence of HPV has been found in the oral mucosa, yet it is required to investigate the route of transmission of HPV in oral mucosa as well as to check whether presence of HPV plays any role in cancer development or it is just a facilitator along with the two major risk factors i.e. tobacco and alcohol.

PP 32: Tumor inhibition potential of Pistia stratiotes (L) extract against mouse melanoma cell lines and as an adjuvant towards radiotherapy

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In this study we investigated *in vitro* and *in vivo* tumor growth inhibition by Pistia stratiotes and its radiosensitizing effect on melanoma cell line. The effect of methanolic extract of Pistia stratiotes (leaves) MEPS on the proliferation of B16F1 and B16F10 melanoma cell lines was determined by MTT and TBE bioassay. These cells were cultured in EMEM and incubated with the dilution series of MEPS (10-100 μg/ml) in CO_2 incubator at 37^o C for 24h. The results of *in vitro* study showed that extract inhibited the growth of melanoma cell lines in a dose dependent manner. Among the two cell lines studied, the extract exhibited maximum anticancer activity with IC_{50} value 5.09 calculated from MTT assay against B16F1 cell line. The *in vivo* effect of MEPS on B16F10 melanoma cells inoculated subcutaneously in C57BL mice was investigated. In this *in vivo* model the effect of MEPS was evaluated at 250mg/kg and 500 mg/kg bodyweight given orally for 20 consecutive days to mice after 24h of tumor inoculation. The reduction of tumor volume of MEPS treated mice shows dose dependent reduction, which was observed on 20th day. The maximum regression produced by MEPS at the dose of 500 mg/kg on 20th day. The radio protective effect of MEPS against radiation induced chromosomal damage was also investigated in mice bone marrow. Treatment of MEPS extract resulted in a decrease in number of total chromosomal aberrations. Structural elucidation of its bioactive principle is in progress. These findings support MEPS as a therapeutic agent against melanoma.

PP 33: Study on the exploration of active components bearing its anticancer properties of *Indigofera* species through NMR and HPLC analysis

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Reactive Oxygen species (ROS) and Reactive Nitrogen species (RNS) are well recognized for playing both beneficial and deleterious role in normal cellular metabolism. Inability in the maintenance of redox homeostasis could lead to potential damage termed as oxidative stress and nitrostative stress. This occur either when there is an over production of ROS/RNS or a deficiency in enzymatic and non-enzymatic antioxidants which can scavenge the free radicals as they are one of the major causative agent of cancer. The rate of increase in cancer incidence and the lack of anticancer drugs forced scientist to pharmacological and chemical investigations in the area of medicinal plants to search for the anticancer agents. The control of cancer the second leading cause of death worldwide may benefit from the potential that resides in alternative therapies. Natural products are available as chemo protective agent against commonly occurring cancer worldwide. A major group of these products are the powerful antioxidants, others are phenolic in nature and the remainder includes reactive groups that confer protective properties. Indigofera aspalathoides is a low under shrub with wide distribution in South India and Srilanka was one of the anti-cancer drugs reported in the early Vedas. The leaves of the plant were subjected to phytochemical analysis, characterization and determination of antioxidant capacities. Previous data on the characterization and quantitation of polyphenolic compounds present in indigofera species is rather limited. Aqueous and crude extract of leaves of Indigofera aspalathoides were subjected to preliminary phytochemical analysis for qualitative and quantitative determination of phytochemicals. Dried and powdered leaf sample were subjected to NMR characterization since NMR experiments enable the determination of 3D structures of protein with a molecular weight up to 100KDa and solution structures of more than 100 plant protein have been established by NMR metabolite profiles of plant extract. HPLC of the powdered leaf sample was also done to separate identify and quantitate the compounds present in the sample. *In vitro* antioxidant activity of the plant and their inhibition towards lipid per oxidation were also performed by DPPH radical scavenging test and Thio barbituric acid test respectively. This study would be a preliminary effort to find out the active components of Indigofera Species which bears anticancer properties through NMR and HPLC studies. Thus gain significance in anticancer studies.

PP 34: *In vitro* cytotoxicity of Arstolochia indica roots against human cancer cell lines

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The study was designed to determine the antiproliferative activity of alcoholic extract of Aristolochia indica using human colon cell lines as a model system. The root extract was prepared using Soxhlet extractor.HT-29 cells were cultured in the presence of extract at various concentrations (10, 20 and 30µg/ml) for 48hrs, and the percentage of cell viability was calculated by using MTT Assay. Our results indicate that alcoholic extract of Aristolochia indica has potential against human colon cell lines. Thus the extract possesses *in vitro* cytotoxicity against HT-29 cell lines. The plant can be explored for the possible development of lead molecules for drug discovery.

PP 35: Expression of cholecystokinin receptors in gall bladder carcinoma

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Carcinoma of the Gall bladder is the third most common carcinoma of the digestive tract in Eastern UP and Western Bihar.The role of cholecystokinin in gallbladder cancer is unknown and may be particularly important since gallbladder itself has a high concentration of cholecystokinin-A (CCK-A) receptors. The objective of the study is to compare the expression of cholecystokinin receptors A and B in normal, cholelithiasis and malignant human gall bladder tissue and blood. A total of 49 tissue samples along with blood of normal (8), gallstone disease (19) and cancer of gall bladder (22) were collected. Total RNA was extracted to study the expression of CCK-A and CCK-B receptors by RT-PCR and the quantitation was done by Real Time PCR using SYBR green based chemistry. In normal gallbladder tissue, CCK-A and CCK-B receptor were expressed in 5/8(62.5%) and 3/8(37.5%) samples. In cholelithiasis group CCK-A and CCK-B receptors were expressed in 13/16(81.25%) and 7/16(43.75%) samples respectively while in CaGB group CCK-A and CCK-B receptors were expressed in 9/18(50%) and 5/18(27.78%) samples. Similarly in blood samples, CCK-A and CCK-B were expressed in 5/8(62.5%) and 2/8(25%) in normal, 13/15(86.67%) and 6/15(40%) in cholelithiasis and 10/19 (52.6%) and 4/19(21.05%) in carcinoma gallbladder group respectively. Higher expression of CCK-A and CCK-B in cholelithiasis and decreased expression of these receptors in carcinoma gallbladder as compared to normal was observed in tissue as well in blood. Though it is not significant in our study, this decreased expression of CCK-A and CCK-B receptor as compared to normal may be involved in the pathogenesis of carcinoma gallbladder if done on large number of patients.

PP 36: Mitochondria mediated apoptosis induction by binuclear ruthenium polypyridyl complexes, on cancer cells

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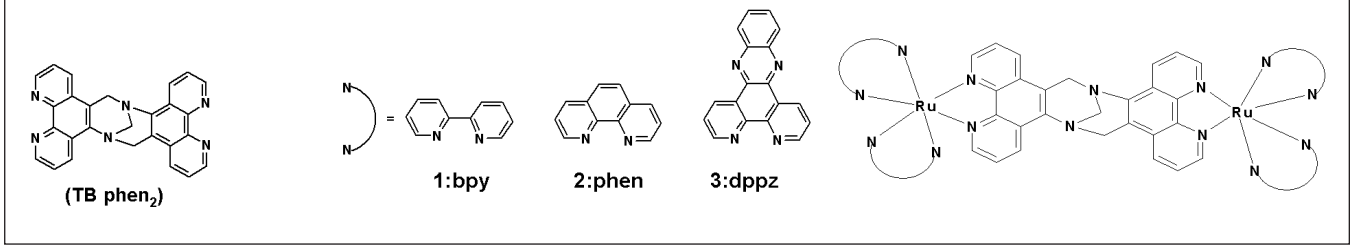
Binuclear complexes of the type $[Ru(N\text{-}N)_4(TBPhen_2)]^{4+}$ where N-N=2,2'-bipyridine(bpy)(1), 1,10- phenanthroline(phen)(2) and dipyrido[3,2-a:2',3'-c]phenazine(dppz)(3) and ($TBPhen_2$)=bis-phenanthroline Troger Base analogue have been evaluated for their antiproliferative activities. *In vitro* screening by MTT assay indicate significant activity in the increasing order of complexes 3>1>2 against human tumor cells, namely, cervical cancer (HeLa), leukemia (HL-60) and THP-1 monocytic leukemia cell line. No significant cytotoxicity was observed for all the compounds towards THP-1 cell lines. The status of



mitochondria was evaluated by a real time living cell microscopy, wherein, complexes 1-2 stimulate apoptosis by activating apoptotic mitochondrial pathways, while complex 3 exhibits necrosis. Cell cycle analysis reveals that complexes (**1**) and (**2**) inhibit the cells in G_0/G_1 phase. The induction of early and late stages of apoptosis was observed using Annexin V binding and further confirmed by morphological evaluation using confocal microscopy. Further, the detailed possible mechanism of these complexes will be presented.

PP 37: Psychosocial and sexual factors in women with breast cancer

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Women diagnosed with breast cancer require immediate psychosocial support. Because breast is an emotional symbol of women's pride and personality, including sexuality and motherhood, any threat to breast is to shake the very core of her mind and feminine orientation. The present study has been undertaken to evaluate the psychosocial and sexual impacts of women with breast cancer. On the basis of treatment modalities offered to the patients, a sample of 97 breast cancer patients matched for age and economic status were studied in a reputed hospital of Delhi. Chi-square test and Fisher's exact test were used to calculate statistical significance. Findings suggest that a majority of the patients had very high level of anxiety and moderate level of stress and borderline levels of depression. It was noted that psychosexual problem is not a major problem because 46.4% women were single and rest 53.6% were married and belonged to a monogamous society. Sexual maladjustment was due to indifference to sex and non co operation from their spouse ($p>0.05$). Nearly half of the women were pre menopausal (52%) and the rest (48%) were post menopausal. Counseling was effective for the quality of life of the women. Social withdrawal symptoms were shown by 6% of women. Breast disfigurement and sexuality were found to be least important, but psychological and social support appears to significantly influence the treatment modalities and rehabilitation of breast cancer patients in India.

PP 38: Antitumor activity of Eruca sativa plant against B16F10 melanoma cells in C57BL/6 mice

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In recent years, Eruca sativa plant (taramira) has gained importance as a vegetable and spice. In the present study, we have assessed the anti-melanoma potentials of different solvent extracts (aerial & root) and seed oil of E. sativa plant. Among the test samples, seed oil showed the maximum inhibition of cells (95%) by *in vitro* bioassay achieved at 24 hr of exposure at concentration 90 μg/ml for B16F10 cell line. The anti-tumor activity of seed oil, therefore, was further tested *in vivo* against reference doxorubicin drug in terms of body weight, tumor weight, tumor volume, tumor growth delay and histological study. Seed oil significantly ($P<0.01$) reduced the tumor growth (29.48%) comparable to tumor control mice. Remarkably, the seed oil inhibited melanoma growth and angiogenesis in mice without any major toxicity. The findings qualify seed oil for further investigations in the real of cancer prevention and treatment.

PP 39: Antioxidant and antimutagenic activities of isothiocyanate rich seed oil of Eruca sativa plant

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Seed oil of the plant Eruca sativa has been explored for antioxidative and antimutagenic potential. Seed oil exhibited maximum percentage inhibition of hydroxyl (93.42%) and 2,2-diphenyl-1-picrylhydrazyl (92.02%) radicals at the concentration of 90 μg/ml. Treatment of mice with seed oil significantly ($p<0.01$) reduced oxidative stress and attenuated the altered changes of reduced glutathione. Seed oil treated group reduced the aberrant metaphase (47.50%) and micronucleus formation (85%) in the bone marrow of melanoma induced mice. The presence of isothiocyanates [allyl (40.3 μg/g), 3-butenyl (259.6 μg/g), 4-methylsulfinybutyl (743.1 μg/g), 2-phenylethyl (158.5 μg/g) and bis(isothiocyanatobutyl)disulphide (~5000 μg/g)] was confirmed by HS/SPME/GC–MS analysis of seed oil and found to be responsible for the observed bioefficacy. Our findings support the use of E. sativa seed oil (ignored edible oil) as health promoting food and its potential for clinical use.

PP 40: PCR based evaluation of high risk HPV-DNA in human oral cancer, precancer and normal oral mucosa- an insight into viral carcinogenesis

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Oral squamous cell carcinoma is the most common cancer of the oral cavity. Although alcohol and tobacco are two known risk factors, some evidence indicates that other factors, such as infection with certain Human papillomavirus (HPV) subtypes and genetic susceptibility, could also be involved in the carcinogenic process. More than 130 different HPV genotypes infecting human skin and mucosa have been identified in various lesions. Recently it has been reported that mucosal high risk HPV subtypes 16 and 18 are related to the biology of human oral mucosal neoplasms. The aim of this study was to ascertain the prevalence of HPV 16 and 18 subtypes in oral squamous cell carcinoma, oral precancerous lesions and normal oral mucosa. 60 paraffin embedded tissue samples (20 oral squamous cell carcinoma, 20 oral precancer and 20 normal oral mucosa) were studied using HPV type specific primer mediated polymerase chain reaction (PCR). Statistically significant differences were obtained in the prevalence of HPV 16 and 18 subtypes between oral squamous cell carcinoma, precancerous lesions and normal oral mucosa. HPV subtypes 16 and 18 also play a role as co-factors in oral carcinogenesis.

PP 41: Cytotoxic and antioxidant activity of Citrullus colocynthis (l.) Schrad against prostate cancer cell lines

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Plants produce a diverse range of bioactive molecules, making them a rich source of different types of medicines. Moreover, plants being rich sources of medicinal compounds have continued to play a dominant role in the maintenance of human health since ancient times. C. colocynthis (L.) Schrad ('bitter apple') is a perennial species grown in sandy areas throughout northern Africa, southwestern Asia, and the Mediterranean. It is a traditional food plant in Africa, it has potential to improve nutrition and boost food security. In this study, bioassays for the estimation of total phenolic content, reducing power activity and DPPH Assay of the plant and cell viability test by MTT assay are carried out on the ethanolic extract of Citrullus colocynthis. Herbal extracts preferentially inhibit the growth of both the cell lines in a dose dependent manner of 40μg, 30μg, 20μg 10μg and 1μg in 24, 48 and 72 hours treatment respectively. 1, 1-diphenyl-2-picryl hydrazyl (DPPH) radical scavenging and reducing power effect of the extract was determined spectrophotometrically. Higher antioxidant activities were recorded in the extract. The results

showed that Citrullus colocynthis having growth inhibition in cells and antioxidant activity.

PP 42: Role of total parenteral nutrition perioperatively in patients with gastrointestinal malignancy

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Preoperative nutritional status plays an important role in patients with malignancy and in the postoperative complications. Malignant disease is often associated with weight loss and malnutrition with decreased immunity. Nutritional support is frequently provided to patients with cancer in an attempt to improve nutritional status and reverse weight loss, with the aim of reducing morbidity and mortality rates This review evaluates the effect of parental nutrition on morbidity and mortality in patients with malignancy undergoing treatment with surgery. We have retrospectively analysed 100 malignant patients from January,2010 to November, 2010 at KMIO in a single unit of Department of surgery of which 55 had received parenteral nutrition and 45 had not. Each arm containing 10 patients of esopahageal cancer who have undergone THE/TTE; 16 patients of gastric cancer who had undergone gastrectomy, 17 patietns of colorectal cancer who had undergone anterior resection or resection and anastomosis. 6 Periampullary cancinoma FOR Wipples surgery, 4 Intestinal resection for obstruction following post operative adhesions, 2 small intestinal neoplasms. Preoperative mean albumin in group 1 who have not received TPN was 2.8 and mean preoperative albumin in patients who had received TPN preoperatively was 3.21.Postoperatively among group 1 patients 3 had anastamotic leak and 2 had wound dehiscence but in patients of group 2 , 1 had wound dehiscence and 2 anastamotic leak. The perioperative nutritional therapy consisted of a solution enriched with branched-chain amino acids, dextrose, and lipid emulsion, I V Albumin, Fresh frozen plasma depending on patient's affordability given intravenously. The evidence suggests that perioperative nutritional support, if given for at least 10 days, reduces morbidity and mortality in patients with biochemical evidence of severe malnutrition, manifest as a low serum albumin concentration and excessive weight loss. TPN for at least 6 to 10 days before an elective oncologic operation to patients who are clearly malnourished or to patients who are normally nourished at the time of hospital admission but in whom a lengthy preoperative evaluation is likely to interfere with an adequate oral diet may benefit by giving perioperative total parenteral nutrition in decreasing post operative complications.

PP 43: Chemopreventive potential of Indigofera trita Linn. on N-nitrosodiethylamine-induced phenobarbital promoted hepatocellular carcinoma (HCC) in male Wistar rats

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Chemopreventive potential of ethanol extract of Indigofera trita (EIT) against N-nitrosodiethylamine (DEN) induced phenobarbital (PB) promoted hepatocellular carcinoma (HCC) in male wistar rats was studied for 16 weeks. The levels of liver injury and liver cancer markers such as ALT, AST, ALP, GGTP, total bilirubin were substantially increased by DEN treatment. EIT (200 & 400 mg/kg/p.o.) treatment reduced liver injury and restored liver cancer markers. EIT also significantly prevented lipid peroxidation and increased the activities of antioxidant enzymes catalase, superoxide dismutase, glutathione peroxidase and glutathione-s-transferase in the liver of DEN treated rats. EIT also significantly improved body weight and prevented increase of liver weight during DEN treatment. Histopathological findings also support the biochemical observations. The results strongly support that EIT prevents lipid peroxidation and promote the enzymatic antioxidant defense system during DEN induced hepatocellular carcinoma which might be due to activities like scavenging of free radicals by the phytochemicals in EIT.

PP 44: MicroRNA 380-The cause of neuroblastoma

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Generally cancer is caused by inactivation of p53 gene (responsible for induction of apoptosis in conditions of stress). In cases, like neuroblastomas, cancer is caused by a new class of gene known as 'microRNAs (miRNA)', produced by parts of the genome that were dismissed as 'junk DNA'. A miRNA i.e. miR-380-5p appears to block the p53 tumour suppressor pathway and allows the cell to survive in conditions of stress. This miR-380-5p binds to the 3' untranslated region (UTR) present as a conserved region in p53.It has been found that this miRNA is highly expressed in the majority of primary neuroblastomas and functions as proto-oncogene in a mouse mammalian transplant model. Hence, this over expression of miR-380-5p along with HRAS oncoprotein is responsible for transforming primary cells. Moreover, inhibition of miR-380-5p results in up regulation of p53 in embryonic stem and neuroblastoma cells leading to the induction of apoptosis, as well as diminished tumour growth *in vivo*. This paper reviews on the mechanism of p53 regulation in cancer and uncovers the potential therapeutic targets for neuroblastoma.

PP 45: Antiproliferative and antioxidant activity of Tribulus terrestris against prostate cancer cell lines

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Antioxidants have been reported to prevent oxidative damage and may prevent the occurrence of disease, cancer and aging. Antioxidants have the capacity to quench free radicals. Tribulus terrestris is a flowering plant in the family Zygophyllaceae, native to warm temperate and tropical regions of the southern Europe, southern Asia, throughout Africa, and Australia. Tribulus terrestris has long been a constituent in tonics in Indian ayurveda practice. It is also used as an aphrodisiac, diuretic and nervine in Ayurveda, and in Unani, another medical system of India. In the present study the antioxidant and antiproliferative activity of Tribulus terrestris against prostate cancer cell lines PC-3 and LN CaP were investigated. The Total phenol content was assayed by spectrophotometric method using Folin ciocalteau reagent. DPPH radical scavenging activity was measured by the spectrophotometric method using Griess reagent. Reducing power assay was determined by Oyaizu method. Cytotoxicity activity of plant extract was measured by MTT - Cell Proliferation Assay and was expressed in a dose dependent manner of 25, 50, 100 and 200 micrograms/ml of plant extract at various time intervals of 24, 48 and 72 hours in both the cell lines. The result of free radical scavenging activity and Total phenolic contents revealed significant antioxidant activity of the plant extract. The MTT assay revealed that the phytochemicals present in plant have significant antiproliferative activity.

PP 46: Biochemical characterization of tumor -associated antigens in mice exposed to hepatocarcinogen

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Various studies suggest that tumor-associated antigens (TAA) can serve as an effective target for active immunotherapy. The knowledge of TAA thus could be utilized in cancer immunotherapy to induce the immune system and to direct it against cancer cells that bear these antigens. The objective of the present study is to successfully monitor cancer induction, to devise a better method for extraction and biochemical characterization of TAA. The chemical agent used to introduce cancer in Swiss albino mice (balb/c) was diethylnitrosamine (DEN), a potent hepatocarcinogen. Several marker enzyme assays and histological examination was carried out in liver tissue to follow up cancer induction. 3% 1-Butanol extraction procedure and Perchloric acid extraction method were employed for extraction of TAA. Biochemical assays were carried out on the extracts to characterize the TAA. Several significant morphological and histological changes were seen. Observations from enzyme assays further support cancer induction. The extracts obtained from both the methods were resolved on SDS-PAGE. A significant alteration in the expression of several glycoproteins was observed.

PP 47: Mammary carcinogenesis inhibition by Acacia catechu: *In vitro* and *in vivo* study

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There has been considerable interest in identifying specific foods and phytochemicals that may have breast cancer preventive properties. Acacia catechu (Leguminoseae) heartwood (AHW) contains significant amounts of polyphenolic compounds which exhibit powerful antioxidative activity. The purpose of this study is to evaluate anticancer activity of AHW extracts on human breast cancer cell lines and in mice mammary tumor model. AHW was extracted by soxhlet apparatus using different solvents from lower to higher polarity. Both cytotoxic and apoptotic properties of the heartwood extract of Acacia catechu were investigated *in-vitro* and *in-vivo*. 3-(4,5-Dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide, a yellow tetrazole (MTT), sulforhodamine B colorimetric assay (SRB), cell proliferation assay and LHD release assay were used to study the cytotoxic properties on three breast cancer cell lines (MCF-7, T-47D, MDA-MB-461). Typical morphological changes including cell shrinkage, chromatin condensation and characteristic DNA ladder formation in agarose gel electrophoresis were observed in AHW-treated MCF-7. The aqueous extract showed a dose dependent growth inhibition response of all tested cell lines with IC_{50} values between 34.9 and 58.6 μg mL^{-1} and was selected for *in-vivo* analysis. The aqueous extract (AQAHW) was further evaluated for antitumor activity against 7, 12-dimethylbenz[a]anthracene (DMBA; 50 mg/kg) induced multiple breast tumors in Swiss albino mice. The tumor volume, percent incidence of observable tumors, total cumulative number of observable mammary tumors per group, tumor burden per mice in each group and extent of necrosis were measured. The AQAHW was administered to mice by gavage one week prior to the treatment with DMBA and throughout the 24-week study. A dose-dependent inhibition of mammary carcinogenesis by AQHW was observed. Cumulative tumor numbers in the group receiving AQAHW were reduced significantly ($p < 0.01$) after 24 weeks. There was 3 weeks delay in the onset of tumors in AQAHW treated animals in comparison to DMBA treated group. The delay of tumor onset was dose-dependent. Body weight and food intake were not affected by AQAHW throughout the 24-week duration when compared to the control group ($p > 0.05$), suggesting there was no toxicity due to extract at any of the doses tested. No tumors were detected in the negative control group untreated with DMBA Thus, this study demonstrated that Acacia catechu is offering promise for therapeutic use in the treatment of breast cancer and further phytochemical studies are required in this direction.

PP 48: *In vitro* studies on anticancerous effect of Garcinol isolated from Garcinia indica and epigallocatechin-3-gallate isolated from Camelia sinensis on HEPG2 liver cancer cell lines

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Histone acetylation is a diagnostic feature of transcriptionally active genes. The proper recruitment and function of histone acetyltransferases (HATs) and deacetylases (HDACs) are key regulatory steps for gene expression and cell cycle. Functional defects of either of these enzymes may lead to several diseases, including cancer. Garcinia indica Hexane extract (GIHE) Garcinol was obtained from fruit part of Garcinia indica, and Camelia senensis Aqueous extract (CSAE) EGCG was obtained from leaves of Camelia sinensis. The effects of Garcinol and EGCG separately and in combination, on transformed HepG2 cells was measured *in vitro* using DMSO soluble MTT colorimetric assay, and the vehicle toxicity also was analysed. The results obtained showed the inhibitory effect of Garcinol as well as EGCG alone, and a higher inhibitory effect when used in combination on the proliferating HepG2 cells. The effect of the vehicle used for dissolving Garcinol was also analyzed and used as a control. The values obtained in the MTT assay experiment showed an inhibitory effect at 100μg/ml of the extracted Garcinol compound and an inhibitory concentration of 40μg/ml of the EGCG extracted from Green tea leaves. The higher effect was observed in the culture which was treated with Garcinol and EGCG combination in the ratio 10:20μg/ml respectively. Effect of Garcinol compound was analysed from the graph and the IC50 value of 50μg/ml was obtained and the least toxic effect of the vehicle was found to be at a concentration of 30%. We concluded that the extracted compound Garcinol with EGCG was more effective in inhibition of HepG2 cells.

PP 49: An assay for screening anti-mitotic activity of herbal extracts

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Herbal Science Trust (HST) has developed an effective palliative herbal extract (HST-K) in the management of pain in terminal cancer patients. We are interested in the purification of the anti-mitotic/therapeutic (referred as bioactivity) component in HST-K. In pursuit of this goal we have developed an *in vitro* method for quantification of the bioactivity in HST-K, based upon the observation that the sprouting of the green gram seed was inhibited by HST-K. The inhibition was found to be dose dependent and was suitable to quantify the bioactivity of HST-K preparations. The method was further extended as an easy screening procedure for anti-mitotic activity of herbal extracts. Synthetic drugs (anticancer drugs) used in palliation of cancer also inhibited the sprouting of the green gram seeds, while other common drugs failed to inhibit the sprouting, indicating the specificity of the assays. Further, we have identified few common vegetables namely onion, garlic & capsicum as anti-mitotic by the above screening method.

PP 50: Anticancer, cytotoxic potential of medicinal plant extracts on heLa cell line

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Cancer is one of the most dreadful diseases with a death toll of millions every year. Cancer ranks the second most common cause of death after cardiovascular diseases. As per the WHO statistics, cancer causes 7.6 million deaths every year worldwide. Apart from the conventional methods for treatment of cancer, natural products have been used as traditional medicines in many parts of the world like Egypt, China, Greece, and India from ancient times. Using the ethnomedical data approach, few Indian medicinal plants (Piper longum, Cassia fistula, Acacia catechu, Cassia occidentalis and

Moringa oleifera) that are used in traditional medicine for cancer and non-cancerous diseases were collected and evaluated for their cytotoxic effects on HeLa cell line and also for their safety on human peripheral lymphocytes. The active components were extracted from the selected plant parts by alcoholic and aqueous extraction methods using standard protocols. The antiproliferative effects of the aqueous and alcoholic extracts (1, 10 and 100 μg/ml) of the above 3 plants were evaluated *in vitro* by employing MTT assay, viability test by trypan blue dye exclusion and apoptosis of the cancer cells were confirmed by DNA fragmentation analysis. Apoptosis was again confirmed by Ethidium bromide- Acridine orange (EB/AO) staining. From the five plants that are used in Ayurveda, aqueous extract of two plants, (Moringa oleifera and Cassia occidentalis) exhibited cytotoxic effects on HeLa cells and least cytotoxicity on lymphocytes. For the plants that are used as anticancer herbal drugs, our results indicated a correlation between the reported use of these plants and their cytotoxic activity on cancer cells.

PP 51: Anticancer activity of Bacopa monniera

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The objective of the present investigation was to study the *in vitro* anticancer activity of Bacopa monniera extract using human colon cell lines. HT-29 cells were cultured in the presence of extract at various concentrations (10,20and 30μg/ml) for 48hrs, and the percentage of cell viability was calculated by using MTT Assay. Treatment with aqueous extract of Bacopa monniera showed significant lysis in cell lines. Thus the extracts possess *in vitro* anticancer activity against HT-29 cell lines. The plant can be explored for the possible development of lead molecules for drug discovery.

PP 52: Genotoxic effect of cancer patient's serum on normal blood leukocytes evaluated by "comet assay"

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Most human cancers are associated with genetic instability. Our previous studies have shown increased level of DNA damage in the peripheral blood leukocytes of cervix and breast cancer patients as compared to the controls. The presence of increased DNA damage in the leukocytes in these cancer patients which is not the target tissue is rather unexpected. According to Werkmiester *et al* (1980), some genotoxic agents are released by the tumor tissue into the blood stream which might be the cause for this increased DNA damage observed in the leukocytes. To investigate the genotoxic activity of cancer patient's blood, the genotoxicity of the sera from cancer patients was evaluated by "comet assay". Comet assay is simple sensitive technique to quantitate DNA single strand breaks, double strand breaks and alkali labile sites at individual cell level. Normal individual's leukocytes were treated for different time points with the serum isolated from cancer patient to check for the genotoxic effect. The cells were later given a chance for repair by incubating the cells after the removal of the serum for different time points to check for the repair efficiency of the normal leukocytes. This is a preliminary study carried out to check for the genotoxic effect of cancer patient's serum. Further detailed analysis need to be carried out to come to a reliable conclusion.

PP 53: Ananas comosus as an adjuvant to radiotherapy during cancer chemotherapy

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Due to perilous effect to radiation on normal cells during the cancer chemotherapy, there is need to develop an effective radiomodifier with lower toxicity, an extended window of protection more favorable administration routes and improved pharmacokinetics compared to the older thiol compounds. Administration of Ananas comosus extract at dose level of 15 ml/kg BW orally to Swiss albino mice provide extremely significant protection on chromosomal aberration induced by graded doses of ^{60}Co gamma radiation (2Gy and 9Gy) on bone marrow cells. The rate of normal metaphase count has been amplified drastically after dosing schedule of fruit extract as compared to radiation control group. Also it was further cross checked at cellular system by isolating macrophages from the peritoneal cavity; and it was observed that our extract possesses immunostimulant activity by showing the improved rate of phagocytosis against heat inactivated yeast as antigen ($P \leq 0.001$). Histopathological studies of small intestine revealed a well differentiated villi and crypt count as compare to irradiated group which shows inflamated villi and crypt in the absorption compartment. Thus our extract may provide positive effect to the cellular system at low cost and might be a good alternative to hazardous effect to radiation during Cancer Chemotherapy.

PP 54: Cytotoxic and apoptotic properties of the essential oil of *Origanum* in hep-g2 cells

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Essential oil of Origanum belonging to Labiatae family possess a wide range of biological activities including antibacterial, antifungal, antioxidant and antimutagenic. In the present study, cytotoxic and apoptotic effects of the origanum oil were examined on a human hepatocellular carcinoma cells Hep-G2. The cytotoxicity of the oil was tested by MTT and neutral red staining. Possible induction of apoptosis by origanum oil was further investigated by acridine orange/ethidium bromide (AO/EB) staining. Results showed that origanum oil was significantly cytotoxic in a dose and time dependent manner on Hep-G2 cells. IC50 value was found about %0,008 (v/v). After incubation of the cells with origanum oil for 48 hours, characteristics of apoptotic morphology such as chromatin condensation, shrinkage of the cells and cytoplasmic blebbing was observed. As a result, origanum oil significantly exhibited cytotoxic and apoptotic activities in hepatocellular carcinoma cells and may has potential as an anticancer agent.
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PP 55: *Candidal* sub species- a bioindicator of malignancy?

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Squamous cell carcinoma of oral cavity is one of the most common malignant neoplasms in India. More than 4 lakhs cases are diagnosed every year. The increase susceptibility to *Candidal* infection in oral squamous cell carcinoma is often documented. Also it has been found that *Candidal* infection are predominantly associated with O+ve Blood Group. The aim of this study is to evaluate the presence of *Candidal* subspecies present in the oral squamous cell carcinoma. To compare these subspecies with those of the unaffected side. A total number of 30 diagnosed cases of oral cancer will be included in this study. The control group consisted of 30 age/sex matched healthy individuals. The patient unaffected side will serve as internal control. The samples for mycological examination will be obtained by using sterile cotton swabs from the lesional surface and also a separate swab was then obtained from the unaffected oral mucosa of the opposite side in same patient. Sample will be inoculated in Sabouraud dextrose agar. For identification purpose, Mackenzie germ tube test will be performed on all isolates. Sub-species identification will be carried out by growth on chromagar and sugar assimilation test. Blood Group was identified by ABO blood group system. The prevalence of candida

is significantly higher in oral cancer patients than in control subjects. Non candida albicans species will be increased in oral squamous cell carcinoma.

PP 56: Nephroprotective effect of ethanolic extract of Tabernaemontana coronaria (L) R.BR. on mercuric chloride induced renal damage in Wistar albino rats

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The present study was designed to evaluate the nephroprotective potential of ethanolic extract of Tabernaemontana coronaria, an important medicinal plant in the Indian system of medicine against mercuric chloride induced nephrotoxicity in male albino rats. Toxicity was induced by administering a single dose of mercuric chloride (3 mg/kg body weight, ip.) in saline on the 18th day followed by extract of Tabernaemontana coronaria (200 mg/kg body weight and 400 mg/kg body weight) for 21 days period of study. At this sub lethal dose of mercuric chloride treatment, creatinine, urea, uric acid and lipid per oxidation contents were significantly increased in serum. A significant rise in the ALT, AST and ALP were also observed. And simultaneously, GPx, SOD, GST, catalase, vitamin C and reduced glutathione activities were significantly decreased due to rupture of kidney tissue caused by mercury toxicity. During the recovery period, mercuric chloride intoxicated rats were again treated with ethanolic extract of Tabernaemontana coronaria (200 and 400 mg/kg body weight) for 21 days. It showed the remarkable recovery of the animals from the adverse effect of mercury toxicity. An enhanced level of LPO, content and altered level of other antioxidant system were restored to near normal level in these rats and this also confirmed by histopathology reports. The result suggested that Tabernaemontana coronaria play vital role in reducing the toxic effect of mercury in the kidney tissue of rats.

PP 57: Astaxanthin modulates tumor invasion and enhances apoptosis in experimental colon carcinogenesis

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Colon cancer is third major cause of cancer mortality worldwide. Several carotenoids with apoptotic properties are reported. In this study, we have investigated the possible mechanism by which astaxanthin, a carotenoid induces apoptosis in 1, 2 dimethylhydrazine induced rat colon carcinogenesis. Wistar male rats were randomized into five groups, group 1 were control rats, group 2 were rats that received astaxanthin (15 mg/kg body wt p.o. everyday), rats in group 3 were induced with dimethylhydrazine (40 mg/kg body wt, s.c.), dimethylhydrazine-induced rats in groups 4 and 5 were either pre or post initiated with astaxanthin, respectively as in group 2. In this study, the expressions of PCNA, BCl-2, Bax, caspase-3 and cytochrome C were studied using Western blot, Immunohistochemistry and Immunofluorescence. Results of this study showed that astaxanthin treatment decreased the expressions of PCNA, BCl-2 and increased the expression of Bax thereby regulating Bax/ Bcl2 ratio for mediating apoptosis in colon cancer cells. The levels of cytochrome C, Caspase-3 were increased in astaxanthin treated group, which suggest the ability of astaxanthin to regulate proliferation by inducing apoptosis in colon cancer cells. Further Electron microscopic analysis showed that astaxanthin treatment restored the distortion in the cell organelles and swelling in the cisternae of endoplasmic reticulum.

PP 58: Study on adverse drug reactions of cancer chemotherapy agents in a tertiary care hospital

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The use of cancer chemotherapeutic agents can lead to severe adverse drug reactions (ADRs), which can be more harmful and life threatening to the patients than the cancer itself. There are several reports on cancer chemotherapeutic agents from various countries, which is associated with adverse drug reactions ranging from mild nausea to fatal myelosuppression. The objective of this study was to assess the pattern of adverse drug reactions (ADRs) in Indian population caused by cancer chemotherapy agents. The study was conducted in Medical Oncology department of a tertiary care hospital, Bangalore. The study was carried out for a period of three months starting from June 2010 to September 2010. 60 patients who were on cancer chemotherapy were selected for the study. The necessary data like demographics, laboratory tests and treatment details were collected from the patients' hospital records. Of the 60 patients included, more than half were male (60%) and rest were female (40%). Age group of 61-70 years was most prevalent. 56% of the patients, who developed ADRs, were on adjuvant chemotherapy. Alkylating agents were responsible for the ADRs in more than half of the patients (52%) followed by antimetabolites (20%). 44% of the reported ADRs were due to Cisplatin with the onset of the reaction within a day. The 36% of patients developed ADRs who stayed in hospital for a period of 1-4 days. Haematological system was affected primarily (40.47%), followed by gastrointestinal tract (33.33%). Grade I neutropenia was most common ADR affecting 28.6% of the patients, followed by emesis (21.4%). Additional dose of anti- emetics was required in 38.5% of the patients. This study provides a baseline data regarding the safety profile of anticancer drugs in Indian population. Similar studies covering additional patients from different regions are required to justify our findings.

PP 59: Protective effect of Aerva lanata on doxorubicin- induced cardiac toxicity in experimental rats

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The development of herbal medicines was mainly presumed by scientists in Asian countries has been a popular folk and an orient medicine treats against many diseases. Herbal medicines produce very less side effects than synthetic drugs. Doxorubicin is mainly used against most type of cancer and it causes the cardiac toxicity. In this study, we evaluate the cardio protective effect of Aerva lanata against on doxorubicin induced cardiac toxicity in rats. Aerva lanata is one of the medicinal plants, it use against various diseases. Body weight, heart weight, Proteolytic activity, total collagen content, membrane bound enzymes, serum markers such as AST,ALT and LDH and electrophoretic separation of LDH and creatine kinase isoenzymes were monitored at the end of 2 weeks. Body weight and heart weight would be significantly decreased in doxorubicin induced group. After treatment of A. lanata body weight and heart weight were back to normal. A.lanata increases the Na+/K+ ATPase, Mg2+ATPase and decreases Ca2+ATPase in cardiac tissue. The repeated administration of doxorubicin causes cardiomyopathy associated with deficit of total collagen and increased level of serum biomarkers such as AST, ALT and LDH. After the pretreatment of A .lanata, it would back to normal. In electrophoretic separation of LDH and Creatine kinase, LDH5 and CK-MB was expressed in doxorubicin induced group when compared with plant treated groups.

PP 60: Significance of allelic deletions at 9p21-24 locus in oral and esophageal cancers among only raw betel-nut chewer tribal patients of Meghalaya state, India

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Among the tribes of East Khasi Hills district in Meghalaya state oral, oropharyngeal and esophageal cancers have one of highest incidence rates. The variety of betel nut chewed by Khasi tribes and other communities here, locally known as 'Kwai', is raw, wet, unprocessed and consumed with betel-leaf and slaked lime without tobacco. The constituents of 'Kwai', show higher alkaloids, polyphenols and tannins as compared to the dried varieties of betel nut. Betel nut chewing with or without tobacco has been shown to be independently associated with the development of esophageal cancer in Assam, India. We analyzed for Loss of heterozygosity a total of 30 patient samples of only raw betel chewers for 10 highly polymorphic Microsatellite markers for genes $p16^{INK4a}$, SH3GL2, MTAP, BDMF, BRIP1, PTPRD, TUSC1, and TEK present in 9p21-24, chromosome regions. We found that 70% (21/30) samples showed LOH for at least one marker. The LOH frequency at marker D9S1679 (TUSC1 gene) was significantly associated (P= 0.0415, CI=95%) in patients with age of >50 and <50 yrs. The marker D9S1748 (p16INK4a gene) showed significant association (P=0.0213, CI=95%) between LOH frequency and stages (T1+T2 versus T3+T4) in the patients. The remaining markers did not show any significant association with sex, age, grade and stage. We may conclude from the results that LOH at D9S1679 marker can be a possible valuable marker in relation of age whereas D9S1748 can be of prognostic value for stages in oral and esophageal cancers of Raw betel – nut (RBN) chewers.

PP 61: Lipid peroxidation, antioxidant status protein oxidation in chronic and acute myeloid leukemia

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Chronic myeloid leukaemia (CML) is a disorder defined by an abnormally high number of peripheral white blood cells and the presence of a chromosomal translocation. Oxidative stress, a pervasive condition of an increased number of reactive oxygen species, is now recognized to be prominent feature of various diseases and their progression. The relationship between antioxidants status and levels of well-known markers of oxidative stress that are measured as lipid peroxides and oxidized proteins reflect better health indices and postures. The aim of this study was to evaluate the role of oxidative stress in pathophysiology of acute and chronic myeloid leukemia by measuring the circulating plasma lipid peroxide levels in terms of malonyldialdehyde, total lipid hydroperoxide and oxidized proteins as protein carbonyl whereas antioxidant status were estimated in terms of reduced glutathione and ceruloplasmin levels in plasma of Chronic myeloid leukemia patients. The present study included 47 acute and chronic myeloid leukemia patients and 20 age-and sex-matched healthy subjects. Out of 47 myeloid leukemia patients, 31 were in chronic phase and 16 in acute. The median age of chronic myeloid leukemia patients was 43 years and that of controls was 42 years. Oxidative stress and antioxidant status in plasma were evaluated by spectrophotometric procedures. There was a significant increase (P<0.05) in plasma malonyldialdehyde, total lipid hydroperoxide and protein carbonyl levels in acute and Chronic myeloid leukemia patients as compared to healthy subjects. Antioxidant status was found to be significantly decreased (P<0.05) in Chronic myeloid leukemia patients and its phases as compared to healthy participants.

PP 62: *In silico* investigations of disordered regions in cancer proteins: Potential implications towards drug binding

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Intrinsically disordered proteins that refer to segments or to whole proteins that fail to self-fold into fixed 3D structure are found to be associated with human ailments diseases such as cancer, diabetes, cardiovascular and neurodegenerative disorders etc. Based on the predictions that about 79% of Human Cancer Associated Proteins from SwissProt database contains 30 or more consecutive residues that are disordered, an investigation was carried out to elucidate the importance of these regions towards drug binding and disease control. A formidable search through Drugbank database was done to retrieve 210 approved drug molecules related to treat cancer which was linked to 253 target sequences. These 253 sequences were subjected to analysis using tools such as DisEMBL and SEG. 127 of these 253 sequences were having 30 or more consecutive residues predicted to be disordered or Low Complexity Regions (LCRs). When searched for structural homologues in PDB, 52 out of these 127 protein sequences revealed quality global alignments. 25 of these 52 proteins had their active site and/ or ligand binding site in "disordered regions", as predicted by Accelrys Discovery Studio 2.5. Eight of these 25 proteins, namely Adenylo succinate synthetase isozyme1, Alpha-mannosidase 2, Cytochrome c peroxidase, Epidermal growth factor receptor precursor, Leukotriene A-4 hydrolase, Endoplasmin, FK506 Binding Protein 3, Tubulin Beta and Dihydroorotate dehydrogenase exhibited that their drugs bound to the "disordered regions". Docking studies were performed using FlexX for proteins Cell Division Protein Kinases 2, 5, 6 & 7, Cellular Retinoic Acid binding protein 1 & 2, Cytochrome P450 2A6, Serum Albumin Precursor, GMP reductase 1 & 2, and GMP Synthase, which indicated that drugs mentioned in drugbank to treat cancer, bound to their respective receptors through binding pockets in the protein with disordered regions in them, indicating that these disordered regions play a potentially important role in Drug binding and probably in cell proliferation control.

PP 63: *In silico* simulation and docking studies of E2F3 tumor marker: Discovery and evaluation of potential inhibitors for prostate and breast cancer

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E2F3 encodes a transcription factor important for cell cycle regulation and DNA replication. It plays a significant role in the development of various types of human cancers. Genomics and proteomics features of the tumor marker have a pronounced significance in the pharmainformatics studies. The crystal structure of E2F3 is not available in any structural database; hence a 3D structure is very essential for structural studies and discovery of potential inhibitors against tumour proteins. In this study we modelled a 3D structure of E2F3 by X-ray crystal structure of Bovine Bc1 with Azoxystrobin of Bos taurus (PDB ID: 1SQB, Chain B) used as the template. Our study found that E2F3 predominantly consists of α helix. The RMSD value of modelled protein was found to be 0.5 A^{o} and steriochemical validation shows 86. 1% residues are in allowed region of Ramachandran plot. Further validation was done by various empirical force fields. Overall quality factor of the model identified to be 57.36 and error values of individual residues are negligible. The modeled protein was submitted to Protein Model Database and can be downloaded with PMDID 0076554.With the help of docking studies the best ligand against E2F3 was found to be vinblastine, an antitumor alkaloid isolated from Vinca rosea, with binding energy -4558.33.The ligand interacts with the modeled protein at residues Glu-432, Asp-433, Tyr-434, Leu-435 and 436.The other best inhibitors identified from our study were Oncovin, Navelbine, Taxol and Taxotere. The investigation concluded that these drugs can be used as the potential inhibitors against E2F3 tumor marker in prostate and breast cancer.

PP 64: Flavonoid rich fraction from Spermacoce hispida inhibits ovarian cancer cell growth: An *In vitro* study

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Flavonoids are polyphenolic compounds and capable of inhibiting the growth of human cancer cells. Spermacoce hispida commonly known as shaggy button weed belongs to the family Rubiaceae. It is widely distributed in Western ghats of Kerala and in Tamilnadu. This plant has strong antioxidant activity. It has been used as a remedy for the treatment of internal injuries of nerves, kidney, and hypertension. In the present study, the flavonoid rich fractions from the whole plant of Spermacoce hispida were isolated and the HPTLC profile revealed the presence of flavonoids. The cytotoxic effects of flavonoid rich fraction of Spermacoce hispida on ovarian cancer cell lines (OAW-42 and PA-1) were analyzed using MTT assay. These cells were treated with different concentration of flavonoid rich fraction 400 – 6.25 μg/ml for 12, 24, 48 and 72 h. This preferentially inhibited the growth of both OAW- 42 and PA-1 cell lines in a dose-dependent manner. The morphological study and DNA fragmentation provided more convincing evidence. Taken together, Spermacoce hispida showed a significant anti-ovarian cancer activity with low toxicity, suggesting its potential to develop as a chemotherapeutic agent.

PP 65: Techniques of cancer prevention

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Cancer, uncontrollable growth of cell due to Carcinogen. Mainly we use chemotherapy in case of malignant cell which affects the human-health as well as in normal cells also. We can reduce the use of chemotherapy by use of Dipicolinic acid. The combination of Calcium and Dipicolinic acid often stabilizes nucleic acids. Another case is biomarkers, because of the heterogeneity among diseases and patients, recharacterization of disease in pathophysiological terms via biomarkers are key to the future of medicine. Diet and nutrients (Tocopherol & β-carotene) protecting from cancer. Turmeric contains curcumin which affects effectively to prevent cancer and Aspirin has been found to reduce the risk of death from cancer. Using some small steps such as Medication, Vaccination, Screening, Genetic testing, Prognosis, Epidemiology we can easily eliminate this deadly disease from the Earth. Chemoprevention or risk-reducing surgery (BRCA1, BRCA2; MSH2 is a gene commonly associated with Hereditary nonpolyposis colorectal cancer) in case Breast, ovarian, pancreatic, colon, uterine, small bowel, stomach, urinary tract.

PP 66: A low serum estradiol/progesterone ratio in cervical cancer with high risk HPV infection

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Though female sex hormones have been implicated in the pathogenesis of cervical cancer, the association of their serum levels with risk of cervical cancer have been inconsistent. This could be due to lack of attempt made so far, to explore the hormonal status in these women. This stimulated us to explore the serum hormonal status (serum Estradiol/Progesterone ratio) and its association with increased risk of cervical cancer among women with high risk Human Papilloma Virus (HPV) infection. We recruited 68 pre-menopausal and 50 post-menopausal women for our study. All women were infected with high risk HPV. Women with High Grade Squamous Intraepithelial Lesions of cervix (HSIL) and squamous cell cervical carcinoma were chosen as cases and women with Low Grade Squamous Intraepithelial Lesions of cervix (LSIL) and chronic cervicitis were chosen as controls. Serum estradiol and progesterone were estimated by Enzyme Linked Immunosorbent Assay (ELISA). The expression of estrogen receptors (ER) and progesterone receptors (PR) in cervical tissues were estimated by Immunohistochemistry (IHC) and quantified by using H score. Pre-menopausal cases showed a low serum Estradiol/Progesterone ratio when compared to controls. The serum hormonal ratio shared a positive correlation with ER expression and negative correlation with PR expression among pre-menopausal study population. There was neither a significant difference between serum Estradiol/Progesterone ratio nor a correlation between the serum hormonal ratio and their receptors' expression among post-menopausal women, but there was a significant association between minimal ER & enhanced PR expression and post-menopausal cases when compared to controls. Our study shows that low serum Estradiol/Progesterone ratio is significantly associated with increased risk of cervical cancer among HPV infected pre-menopausal women but further light could be thrown on such an association by extending the study to a large population.

PP 67: Anti-carcinogenic effect of emilia sonchifolia (l) dc. In azaserine - induced pancreatic cancer in Albino rats

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Pancreatic cancer is one of the most difficult cancers to treat using conventional western medicine. There is an increasing interest in identifying potent cancer preventive and therapeutic agents against it. The aim of this study is to focus on the anti-carcinogenic effect of Emilia sonchifolia on azaserine-induced pancreatic oxidative stress and carcinogenic response in wistar albino rats. Administration of azaserine (30 mg/kg body weight i.p weekly for 1 month) to male wistar albino rats resulted in the significant decrease of enzymatic antioxidants like superoxide dismutase (SOD), catalase (CAT), glutathione peroxidase, (GPx), glutathione –S- transferase (GST) and non-enzymatic antioxidants like vitamin C and glutathione content (GSH) and significant increase in pancreatic RNA and protein content, serum amylase and proteolytic activity. The results of the biochemical parameters were evident from the histopathological studies which show the damaged pancreas. Treatment of rats with the n-hexane extract of Emilia sonchifolia for 16 weeks resulted in a decreased oxidative stress and concomitant reduction in pancreatic damage. Thus, the present study suggests that Emilia sonchifolia can be used a therapeutic agent against pancreatic cancer.

PP 68: Molecular mechanism of IGF-1 and lithium chloride action on GSK-3 inhibition in hormone-dependent breast cancer cell line: A comparative study

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The Insulin-like growth factor system has been implicated in breast cancer progression through several proliferative pathways. Lithium chloride is used as a selective inhibitor of GSK-3β. Both IGF-1 and lithium chloride inhibit GSK-3β, but the similarity in the mechanisms regulating cell survival and proliferation in breast cancer cells was not clear. Hence, the effects of IGF-1 and LiCl on the cell survival through GSK-3β phosphorylation in MCF-7 cells were analyzed. MCF-7 cells were treated with or without IGF-1 or LiCl in the presence or absence of pharmacological inhibitors like LY294002 or PD98059 for 24 hours. mRNA and protein expression of IGF signaling molecules were analyzed by RT-PCR and immunoblotting, respectively. Our results showed that MCF-7 cells exposed to IGF-1 or LiCl differ in their mechanism of inhibiting GSK-3β, where IGF-1 involves the PI3K/Akt or MAPK pathways, while the latter is totally independent of these pathways. *Support by UGC-RFSMS, New Delhi.*

PP 69: Preclinical renal cancer chemopreventive efficacy of geraniol by modulation of molecular pathways

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The present study was carried out to evaluate the chemopreventive effects of Geraniol against ferric nitrilotriacetate (Fe-NTA)–induced renal oxidative stress, hyperproliferative response, and two-stage renal carcinogenesis. Geraniol is an acyclic monoterpene alcohol emitted from the flowers of many species, notably roses, against Fe-NTA mediated renal oxidative stress, inflammation and tumor promotion response along with explication of the implicated mechanism(s). Administration of Fe-NTA (9 mg/kg bd wt, i.p.) to Wistar rats induced marked oxidative stress in kidney, evident from augmentation in renal Kidney injury molecule1 (Kim1) expression, depletion of glutathione content and activities of antioxidant and phase II metabolizing enzymes, and enhancement in production p53 in addition to proliferating marker PCNA. Fe-NTA also significantly activated proinflammatory marker NFκB and down regulated the expression of caspase dependent proapoptotic pathway genes: effector Caspase 3 as well as initiator caspases 8, 9 and 10. However, supplementation of Geraniol conferred a significant protection against Fe-NTA induced oxidative stress and inflammation. It suppressed the Kim1 expression, restored the antioxidant armory, ameliorated NFκB activation and decreased the expression of proinflammatory mediators. Geraniol also suppressed Fe-NTA induced hyperproliferation in kidney, ameliorating renal PCNA activity and inducing the proapoptotic pathway. From these results, it could be concluded that Geraniol markedly protects against chemically induced renal cancer and acts plausibly by virtue of its antioxidant, anti-inflammatory and antiproliferative activities. This is the first report of the *in vivo* chemopreventive effect of Geraniol against Fe-NTA induced rat kidney cytotoxicity and carcinogenesis, suggesting its potential use in chemoprevention of cancer.

PP 70: Role of neovascularisation in oral squamous cell carcinoma and its role in metastasis: An immunohistochemical study

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Neovascularisation is a process in which new blood and lymphatic vessels are formed. Lymphatic vessel density (LVD) and microvessel (blood vessel) density (MVD) are important factors in assessing the malignant potential of tumors and patient survival. In present study LVD was defined as the density of D2-40- positive lymphatic vessels and MVD as the density of CD-105 positive microvessels per unit area of tissue. The purpose of the study was to assess prognostic significance of both LVD and MVD in oral squamous cell carcinoma (OSCC). In total, 30 OSCC tissue samples were evaluated for LVD, and MVD expression using D2-40 and CD-105 respectively as immunohistochemical markers. The LVD and MVD were compared in intratumoral and peritumoral area and amongst metastatic and non metastatic OSCC. Correlations among these parameters and clinic-pathologic factors were examined. LVD ($P<0.05$) and MVD($P>0.05$) were higher in tumors that were positive for lymph node metastasis. The MVD was higher in recurrent OSCC cases than the primary OSCC ($P<0.05$). LVD and MVD was higher in OSCC than normal oral mucosa. LVD and MVD did not correlate with other parameters like tumor size, site, age, sex and histopathological grade. Lymphangiogenesis and neoangiogenesis are seen in OSCC and influence the metastasis of OSCC to regional lymph nodes. The current results suggested that LVD and MVD are useful tools for deciding on therapeutic strategies in patients with OSCC. Unnecessary elective radical neck dissections can be avoided and targeted drug therapy can be used in treatment of OSCC.

PP 71: Cytotoxicity of nano-engineered carriers incorporating 5-fluorouracil, calcium leucovorin and irinotecan on human colorectal adenocarcinoma cells

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Colorectal cancer (CRC) is one of the most common malignant tumors worldwide with the disease incidence rising with advanced age. The use of conventional chemotherapy is hampered due to obstacle such as poor specificity, side effects, drug resistance and poor stability of cytotoxic drugs. These hindrances may be partially overcome by encapsulating them as Solid lipid nanoparticles (SLN). The main goals of SLN in terms of drug delivery are to increase the bioavailability and efficiency of drugs, to control nonspecific toxicity, immunogenicity, pharmacokinetics and pharmacodynamics of drugs. Our objectives were to design novel drug delivery systems for targeted therapy using pharmacogenomic approach. In the present study SLN was prepared by solvent injection method and incorporated with 5-Fluorouracil, Ca-Leucovorin and Irinotecan. Measures of anti-carcinogenic potential and inflammatory response of the nano-engineered formulations were investigated using cultured HT-29 (human colorectal adenocarcinoma) cells. Evaluation of anti-carcinogenic potential by Annexin-V-FITC/PI apoptosis assay following 48 h treatment with SLN and native drugs delineated significant differences, establishing better potential efficacy of nano-engineered drugs. Secreted cytokine levels measured through multiplex cytometry bead array in SLN loaded drugs showed marginal inflammatory activity in comparison to native drugs. Higher internalizing ability, better antitumor efficacy and lesser cytotoxicity of SLNs was attributed to increased accumulation of drugs in the HT-29 cells. The results of our study implied that these nano-carriers could possibly enhance antitumor effect *in vivo* with low systemic toxicity for the treatment of locally advanced and metastatic human colorectal carcinoma.

PP 72: Role of cyclophosphamide metabolizing enzyme polymorphisms with treatment outcomes in breast cancer patients

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Cyclophosphamide (CP) based chemotherapy is the main treatment for women with breast cancer. Pharmacogenetic variability in drug metabolism is one possible mechanism which may influence its toxicity or efficacy. Activation of CP to 4-hydroxycyclophosphamide is catalyzed by the hepatic cytochrome P450 (CYP) isozymes. CYP3A5 and CYP2C9 are such drug metabolizing enzymes. We hypothesized that genetic variants of CYP3A5-CYP3A5*3 (rs776746), CYP2C9 – CYP2C9*2 (rs1799853) and CYP2C9*3 (rs1057910) may have an impact on the efficacy or toxicity of the cyclophosphamide therapy in the breast cancer treatment. Clinical outcome on survival, toxicity and recurrence in 101 breast cancer patients was followed in this pilot study. The patients were genotyped for CYP3A5*3 (6986A>G), CYP2C9*2 (432C>T) and CYP2C9*3 (1077A>T) polymorphism using PCR-RFLP.

Chi square and logistic regression was carried out using SPSS ver.15.0 Out of 101 patients, there was dose delay or dose reduction in 5 patients due to toxicity (neutropenia/leucopenia) and therapeutic failure in terms of disease recurrence was noticed in 1 patient. One patient did not respond to the therapy. In patients with dose delay, all five had at least one variant allele of CYP3A5*3 and 2 patients were carriers of CYP2C9*3. The patient who did not respond to the treatment had variant alleles of CYP3A5*3 and CYP2C9*3. However, sample size was insufficient for statistical analysis. Therefore, larger sample size may be required to ascertain the role of cyclophosphamide metabolizing enzyme genetic variants with treatment outcomes.

PP 73: Ellagic acid inhibited proliferation and induced apoptosis in human colon adenocarcinoma HCT-15 cells

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Colon cancer is the leading cause of cancer death in both men and women worldwide. Ellagic acid (EA) is known for its multiple beneficial effects. The aim of this study was to investigate mechanisms involved in the growth inhibitory and apoptosis promoting activities of EA, in human colon adenocarcinoma (HCT-15) cell. The HCT-15 cell line was cultured in RPMI1640 medium and the 3-(4, 5-dimethylthiazol-2-yl)-2, 5-diphenyl tetrazolium bromide (MTT) assay was performed. The production of reactive oxygen intermediates (ROS), in HCT-15 cells treated with EA was spectrofluorimetrically quantified using 2, 7-dichlorodihydrofluorescein diacetate (H_2DCF-DA). Propidium iodide staining and DNA fragmentation studies were executed to confirm the role of EA inducing apoptosis. Matrix metallo proteinases (MMP)-2/9 expressions were analyzed by zymography. Immunofluorescence analysis for p53, pAkt and immunoblot analysis for PI3K, Bax, Bcl-2, caspase-3 were carried out. In this study two dosages of EA were used (60 & 80 μM), based on cell viability, alkaline phosphatase (ALP) and lactate dehydrogenase (LDH) assay studies. ROS production increased with time, after treatment with EA. EA induced apoptosis in HCT-15 cells was revealed by DNA fragmentation and phosphatidyl serine exposure. Dose dependently, EA reduced the expressions of MMP-2/9. The phosphorylation of p85/PI3K and pAkt decreased following EA treatment. Up-regulation of pro-apoptotic proteins (p53, Bax and caspase-3) with concomitant down regulation of anti-apoptotic protein (Bcl-2) was noted after EA treatment, which indicated that the mitochondrial pathway was involved in the apoptosis signaling pathway. We speculate that EA increased the production of ROS, decreased cell proliferation and induced apoptosis in HCT-15 cells, which suggested the therapeutic potential of EA against colon carcinoma. Umesalma thank Council of Scientific and Industrial Research (CSIR), Government of India, for financial assistance in the form of senior research fellowship (09/115(0711)/2010-EMR-I).

PP 74: Quantification of Reactive Oxygen species and its association with anemic prevalence among patients with different type of cancer

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Cancer a Latin derived word which refers to conditions of malignancy which means abnormal and uncontrolled proliferation of cells. Reactive Oxygen species and cellular oxidant stress have long been associated with cancer. The mutation in nuclear /mitochondrial genes encoding components of mitochondrial Electron Transport chain can lead to increased level of ROS. Its generation resulting in tumor progression and anemic prevalence leading to 65% of relative risk of death among cancer patients. Study population involves 50 patients with different types of cancer attending the Department of Preventive Oncology at Government Rajaji Hospital Madurai. Serum ROS quantified using NBT assay and anemic prevalence determined using Erythroid Indices**.** Due to mutational aspect of tumor suppressor gene and DNA damage documents an Imbalance between ROS and antioxidant defense. Elevated level cause deleterious effect on RBC resulting in anemic prevalence among cancer patient. Exogenous antioxidant enzyme need to be focused as potent tool for therapeutic management there by reduce the risk of oxidative stress and anemic prevalence among patient with cancer. Results will be presented at the time of participation.

PP 75: The plastic cancer link- A potential public health concern

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Ever since exposure to vinyl chloride monomer was linked to a rare form of liver cancer in factory workers attention has been focused on the relationship between exposure to plastics and cancer. Given the large-scale use of plastics in food wraps, microwave cookware, food containers and baby bottles, it is vital to determine if plastics have any neoplastic potential. Ingredients of plastics with neoplastic potential include (a) Plastic monomers – vinyl chloride, styrene etc. (b) Additives – antioxidants, stabilizers, plasticizers etc. added to improve the performance of pure polymers (c) Residual compounds - catalysts, products introduced during recycling etc. The research on plastic can cer link should not be limited to the carcinogenic potential of virgin material or to plastics certified for use in microwaves. Usage patterns wary widely and containers not certified for safe microwaving may be used in a microwave. Similarly, it is vital to study the effect of washing patterns and aging on the effect of leaching of potential carcinogens. A large body of literature has demonstrated that some chemicals found in common plastics may have a U shaped dose response curve. These chemicals may induce carcinogenesis at concentrations considered to be safe for use in food contact substances due to entirely novel mechanisms not addressed adequately by traditional toxicity testing. Components of plastics may cause cancer by (a) disruption of endogenous endocrine regulation (b) promoting tumor progression (c) Genotoxicity (d) increasing susceptibility to other carcinogenic events.

PP 76: Evaluation of the cytotoxicity of vegetable plant extracts on cultured hela cells

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Few commonly used vegetable plants like cucumber, ridge gourd and ash gourd (*Cucumis sativus, Luffa acutangula and Benincasa hispida* respectively) that are reported to have medicinal properties in traditional systems of medicine were collected and evaluated for their cytotoxic effects on HeLa cell line. The antiproliferative effects of the aqueous extracts (50, 100 and 150 μg/ml) of the above 3 plants were evaluated *in vitro* by employing MTT assay, viability test by trypan blue dye exclusion and apoptosis of the cancer cells were confirmed by DNA fragmentation analysis. From the three plants that are used commonly by people in daily cooking, aqueous extract of the seeds of two plants, (*Luffa acutangula and Benincasa hispida*) exhibited cytotoxic effects on Hela cells and the IC_{50} value was computed as 100 μg/ml and < 50 μg/ml respectively for ridge gourd and ash gourd seeds. Our results demonstrate that ash gourd killed the HeLa cells very effectively *in vitro* and deserves attention as an antineoplastic agent.

PP 77: Guardians of the genome function as regulators of happiness: p53/p73/p63 is a negative regulator of depression

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The molecular basis of depression is poorly understood. It has recently been shown that increased expression of Dual-specificity phosphatase-1 (DUSP1) causes depressive behavior. p73/p63 null mice have been shown to suffer from behavioral and neuronal defects. However, the molecular basis of these defects remains nebulous. Based on these data, I have hypothesized that p73/p63 may regulate depression. Remarkably, bioinformatics analysis of miRNAs that target DUSP1 revealed p53/p63/p73-miRs—such as miR-200b/c; let-7 and miR-101—suppress its expression, suggesting that p53/p63/p73-miRs may function as negative regulators of depression. Furthermore, p53/p63/p73-miRs (miR-200b/c; let-7 and miR-101) that target DUSP1's expression appear to be conserved in Human, Rhesus, Chimpanzee, Mice, Rat, Frog, Cow, and Dog. Further, chronic depression has been shown to increase the stress hormone cortisol in the blood, which in turn may cause insulin resistance and type II diabetes by counteracting the effects of insulin. Interestingly, p53 has been shown to suppress the expression of cortisol receptor at the transcriptional level, suggesting that it may inhibit the functions of cortisol. Remarkably, bioinformatics analysis of miRNAs that target cortisol receptor revealed p53/p63/p73-miRNAs--such as miR-22, miR-124(3 sites), miR-30, miR-18, & miR-142-3p--may suppress its expression. Furthermore, p53/p63/p73-miRs [miR-124(3 sites), miR-30, miR-18, miR-22, & miR-142-3p] that target cortisol receptor expression appear to be conserved in Human, Rhesus, Chimpanzee, Mice, Rat, and Dog. Identifying compounds that suppress the expression of DUSP1 or cortisol receptor is of importance in the treatment of depressive behavior. Remarkably, Curcumin, the commonly used curry power and an inducer of p53 (possibly, p73/p63), has been shown to induce the expression of miR-22 expression, suggesting that curcumin—that is believed to be sacred in nature in the Indian continent—may negatively regulate depression by suppressing the expression of DUSP1/cortisol receptor. Together, this study identifies for the first time the tumor suppressor p53/p63/p73-dependent miRs that function as regulators of happiness.