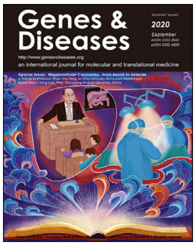
Genes & Diseases (2020) 7, 456—484

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: http://ees.elsevier.com/gendis/default.asp



VIEW ON NEWS

Proceedings of the National Conference on Biotechnology Innovations (NatConBio-2019), Barabanki, Uttar Pradesh, India, September 27—28, 2019

About the conference

The main aim of the conference is to provide a platform for students, researchers, academicians and industry professionals to deliberate on the latest innovations, practical approach, current research findings, and their applications in the field of biotechnology, health, agriculture and environmental biotechnology. This National Conference will be a premier forum for presentation of recent advances and innovations in the field of biotechnology, microbiology, biochemistry, neurobiology, pharmacy, food science, sustainable development program, drug discovery, therapeutics and environmental issues with a focus on the real time problems. Invited lectures by eminent scientists will be the part of this program. Presentation of SBTI awards and poster awards will be the highlight. Participating in NatConBio2019 will give an approach to meet, cooperate and deliberate latest technologies, for advancement in the field of life sciences, customized and personalized product development. The detailed full proceeding of NatConBio2019 can be found in the Supplemental Materials.

The organizers

Shri Ramswaroop Memorial University (SRMU).
Institute of Bio-Sciences and Technology.
Society for Biotechnologists, India (SBTI).

Messages for the conference

Biotechnology today is a sunrise area with potential to meet the basic human requirements of the human being. Societies have a very important role to play in the promotion, awareness and sensitization of Science and Technology programs and related activities. They have become an integral part of application of Science and Technology for societal welfare.

The activities of the Society for Biotechnologists (India) have grown manifold since 1995 and the membership also is increasing. It shows the interests of scientific community in recognizing and rewarding scientists to encourage them as also to convey the message of science throughout the nation. Biotechnology is a field which has developed all over the world with phenomenal speed; its interventions are relevant for improvement in the areas of agriculture, health care, environment, industry and employment generating activities.

My best wishes for the success of all their endeavors.

—***Prof. (Dr.) Manju Sharma, Former Secretary, Department of Biotechnology, Government of India***

I am delighted to learn that "National Conference on Biotechnology Innovations: Interdisciplinary approach to agriculture, food, health, environment and sustainable development (NatConBio-2019)" and Annual Meet of Society for Biotechnologists (India) is being jointly organized by Shri Ramswaroop Memorial University and Society for Biotechnologists (India) from September 27 to 28, 2019 at Shri Ramswaroop Memorial University. The topic chosen for this conference is very relevant to meet the present need of the country. Such conference provides opportunities to exchange new information and learn the latest researches in the field. These are extremely useful for young researchers and students as it provide platform to meet the experts and discuss their research and seek guidance.

I congratulate the organizers for holding this important conference and wish great success to the two days event.

—***Prof. (Dr.) P. K. Seth, NASI Senior Scientist, Former Chief Executive Officer, Biotech Park, Lucknow and***

Peer review under responsibility of Chongqing Medical University.

https://doi.org/10.1016/j.gendis.2019.10.015
2352-3042/

Former Director, Indian Institute of Toxicology Research, Lucknow

It gives me utmost pleasure in welcoming the delegates for the ***National Conference on Biotechnology Innovations 2019***, jointly organized by Shri Ramswaroop Memorial University, and Society for Biotechnologists (India).

This conference would provide a suitable platform to all the participants to share, and exchange their views on evolving thoughts in healthcare, agriculture, food security, climate change, and sustainable development.

The conference will provide ample networking opportunities, and promote fruitful partnerships amongst different stakeholders.

I congratulate the Institute of Biosciences and Technology, SRMU, for organizing the conference, and wish the entire team a grand success!

*— **Er. Pankaj Agarwal, Chancellor, Shri Ramswaroop Memorial University, Barabanki***

Our understanding of functioning of life has significantly improved in the recent years. This conference is a convergence of researchers, academicians, students, and industry personnel to deliberate upon the advancements made in biotechnology, which have considerably impacted our lives.

I extend a warm welcome to the delegates for the ***National Conference on Biotechnology Innovations 2019***, jointly organized by Shri Ramswaroop Memorial University (SRMU), and Society for Biotechnologists (India).

It is my fervent hope that the interactive sessions would give rise to new ideas, ignite young minds, and further our grasp on the emerging trends in biotechnology.

I congratulate the Institute of Bio-Sciences and Technology, SRMU, for organizing the conference, and wish the entire team a grand success!

*— **Mrs. Pooja Agarwal, Pro Chancellor, Shri Ramswaroop Memorial University, Barabanki***

Greetings from Shri Ramswaroop Memorial University, Barabanki.

It gives me immense pleasure to welcome all the delegates for the two days National Conference on Biotechnology Innovations: "Interdisciplinary Approaches to Agriculture, Food, Health, Environment and Sustainable Development, jointly organized by Institute of Bio-Sciences and Technology, and Society of Biotechnologists (India) on the 27th and 28th of September, 2019, hosted by Shri Ramswaroop Memorial University, Barabanki.

Biotechnology being a key area surely has a significant role to play in the areas of agriculture, food, health, industry and environment. The present national conference with delegate participation from all over the country, will serve as an appropriate forum for deliberations on the recent advances in the field of Biotechnology and its applications. I am sure that the delegates will have quality time hearing to invited lectures by eminent scientists from national and international institutions of repute. The conference also hosts ample opportunities for young researchers to showcase their research aptitude and skills through oral and poster presentations. I am sure that this conference will be a good amalgamation of mentors and mentees, benefitting the young and budding Biotechnologists.

I take this opportunity to congratulate the organizers for this wonderful event and I wish the conference a resounding success.

*— **Prof. (Dr.) A. K. Singh, Vice Chancellor, Shri Ramswaroop Memorial University, Barabanki***

I welcome all the delegates to our campus to participate in the **National Conference on Biotechnology Innovations: Interdisciplinary Approaches to Agriculture, Food, Health, Environment and Sustainable Development** and annual meeting of Society for Biotechnologists India, jointly organized by Faculty of Bio-Sciences, Faculty of Biotechnology, Institute of Bio-Sciences and Technology and Society for Biotechnologist (India), on behalf of Institute of Bio-Sciences and Technology.

To address the complex issues faced by the modern society, the scientists and engineers must have unique capabilities. This potential in our young researchers will probe and explore problems, to find and critically evaluate information and to effectively communicate research findings to others.

In this context, the conference will provide a wonderful platform for you to refresh and strengthen your domain knowledge and explore the most up to date information regarding the applications of biotechnology. The conference will provide ample opportunity for all of you to interact with leading scientists and experts in the field of biotechnology and its interdisciplinary areas. The keynote and plenary talks from top-level scientists, leading experts, Oral and Poster abstract presentations in various scientific sessions will provide you the latest information in the field and insights for finding solutions for the current societal needs.

I sincerely hope that the young researchers, faculty and students will derive maximum benefit from this two-day national conference.

I wish the conference all the very best wishes.

*— **Prof. (Dr.) Sanjiv Kumar Maheshwari, Director, Institute of Bio-Sciences and Technology***

The Society of Biotechnologists India (SBTI) is honored and have great pleasure in organizing the Annual Meeting 2019 along with a National Conference on Biotechnology Innovation: *Interdisciplinary Approach to Agriculture, Food, Health, Environment and Sustainable Development* (NatConBio-2019) at Shri Ramswaroop Memorial University, Barabanki (UP) during September 27—28, 2019. This will provide a platform for students, young researchers, academic faculty and eminent scientists to interact with each other and generate valuable inputs to new directions and initiatives for research and manpower development. The field of Biotechnology has made impressive progress during the past 2-3 decades with profound impact and benefit to humanity. Deliberations and interactions of innovative ideas by the scientific community during NatConBio-2019 will certainly help in enhancing capacity building in application oriented and industry based research and promotes new start-ups by young graduates towards developing appropriate technologies and innovations for the benefit of society. Keeping this in view SBTI has instituted six Awards for young scientists in different areas of Biotechnology given every year during the Annual Meeting for the best oral presentations selected by a panel of judges.

I would like to congratulate and place on record my gratitude to Prof. (Dr.) A K Singh, Vice-Chancellor, Shri Ramswaroop Memorial University and the University Administration for extending full support and encouragement to Dr. Sunil Kumar, Convener, NatConBio-2019 and his team from the Institute of Bio-Sciences and Technology in organizing this event in this beautiful campus.

I extend my warm greetings and compliments to recipient of Awards, distinguished invitees and scientists, all the participants, my dear colleagues, partner Institutions and associated Industries and wish NatConBio-2019 all success.

— ***Prof. (Dr.) Edathil Vijayan FNASc, MAMS, President, Society for Biotechnologists India (SBTI)***

It's a pleasure to express the appreciation to Institute of Bio-Sciences and Technology, Shri Ramswaroop Memorial University, Barabanki, Uttar Pradesh, India for organizing Two days National Conference and Annual Meet of Society for Biotechnologists, India (SBTI)-2019 at Barabanki (Uttar Pradesh) India. The Annual meet of SBTI is held at national institutes or universities and serves as a platform for the dissemination of high-quality research and exchange of ideas. This year, Institute of Bio-Sciences and Technology, Shri Ramswaroop Memorial University, Barabanki is hosting the SBTI Annual meet and the 'National Conference on Biotechnology Innovations' with its focal themes on *interdisciplinary approaches to Agriculture, Food, Health, Environment and Sustainable Development*. The conference focuses to address many relevant global issues, which is a need of the hour, and hence very appropriate at this point.

The conference organizers at Shri Ramswaroop Memorial University put a lot of effort to enrich the two days event with keynote and plenary lectures by renowned scientists and researchers in addition to the invited lectures and other oral presentations. The conference serves as a venue for the Society to honor a senior scientist in India with 'Padmabhushan Professor M.V. Pylee Life Time Achievement' and a distinguished neuroscientist with 'Dr. C. S Paulose Memorial Oration Award' in addition to 6 awards for young researchers in different areas of biological sciences. The large number of participants registered for SBTI Award presentations clearly shows the interest and relevance of the conference topics among scientific community. On behalf of the Society for Biotechnologists (India), I wish all delegates a very interactive and enriching technical sessions. I wish the conference a grand success.

— ***Dr. Anju T R, Secretary, Society for Biotechnologists India (SBTI)***

I am delighted to enthusiastically welcome you to the ***National Conference on Biotechnology Innovations 2019***, jointly organized by Shri Ramswaroop Memorial University, and Society for Biotechnologists (India).

The conference would cover areas as diverse as health, food, agriculture, and sustainable development. It would bring together leading scientists and experts to share their ideas and contemplations in their areas of expertise.

The conference would provide a unique opportunity for fostering collaborations amongst scientists, academicians and research scholars.

I wish all the best to the entire team for a magnificently successful conference!

— ***Dr Mahesh Kumar Basantani, Dean, Faculty of Biosciences, Institute of Biosciences and Technology***

Dear Friends and Colleagues.

It gives me a great pleasure and an honor to extend to you a warm invitation to attend the Three days National conference on Biotechnology Innovations: Interdisciplinary Approach to Agriculture, Food, Health, Environment and Sustainable Development" (NatConBio-2k19) at the Institute of Biosciences and Technology, Shri Ramswaroop Memorial University (SRMU), Lucknow Deva Road, Barabanki (UP).

The theme of the National conference will include — Bioinformatics, Agriculture, Molecular Biology, Genetic Engineering, Microbiology, ImmunoTechnology, Plant Biotechnology, Nano Biotechnology, Bioprocess Engineering, Medical Biotechnology and Genomics & Proteomics. Conference will provide an avenue for students, research scholars and faculties to showcase their research potential. The collaborative sessions in the conference will enlighten the students, research scholars and teachers from the scientific community about the ongoing developments in biotechnology and will also give them a platform to express their embarkments in the field of research.

Your stay at SRMU campus, which is a green, serene, and pollution free campus will be academically gratifying.

My best wishes for the productive execution.

— ***Dr. Sachidanand Singh, Dean, Faculty of Biotechnology, Institute of Bio-Sciences and Technology***

It is our great pleasure and honor to invite all the delegates for the two days National Conference on Biotechnology Innovations: *Interdisciplinary Approach to Agriculture, Food, Health, Environment and Sustainable Development* (NatConBio-2019) and the Annual meet of Society for Biotechnologist (India), jointly organized by Faculty of Bio-Sciences, Faculty of Biotechnology, Institute of Bio-Sciences and Technology Shri Ramswaroop Memorial University, Barabanki, Uttar Pradesh and Society of Biotechnologists (India) on the 27th and 28th of September, 2019, hosted at Shri Ramswaroop Memorial University, Barabanki, Uttar Pradesh, India. The objective of the conference is to facilitate a detailed deliberation in the field of Biotechnology and allied disciplines, its recent advancements and innovations. It provides a great platform for national and international research collaborations in diverse and interdisciplinary fields of Biotechnology. The conference promises to inculcate a research culture among the young and aspiring minds of the country.

This conference would be an ideal forum for sharing of knowledge, exchange of ideas and communicating your recent research findings in the field of biotechnology. This would provide latest insights and scope for undertaking future research works which helps to find the solutions for various challenges in the field of agriculture, food, health, environment and sustainable development. The program includes 14 invited speakers of national and international repute on the key areas of Biotechnology. The conference has gained national attention with submission of papers reaching from all over the country with nearly 120 abstracts, segregated to oral and poster presentations under various focal themes of the conference. The main attraction of the conference is the different awards generously sponsored by the Society of Biotechnologists (India) to encourage researchers across the country. I hope that you will find the program intellectually rewarding and I wish all the delegates a pleasurable stay at Shri Ramswaroop Memorial University, Barabanki. I wish all the very best wishes for your future academic endeavors.

— ***Dr Sunil Kumar**, Convener, **NatConBio-2019**, Associate Professor, **Faculty of Bio-Sciences**, Institute of Bio-Sciences and Technology, **Shri Ramswaroop Memorial University**, Barabanki (UP) India*

Abstracts of the invited talks

A success story of biotechnology in transforming lives of people with invisible disabilities

Vinay Singh, CEO, Orange Neurosciences, Kingston, Ontario, Canada, Email: vinay@syngpharma.com.

Multi-generational poverty, unemployment, mental health issues and criminal behaviors have been shown to have a significant correlation with each other. Level of education has been shown to have a strong determinant for a socio-economic index of a society and healthcare.

Reading is an acquired skill. Learning Disability (LD) causes difficulties primarily with reading fluency, comprehension, language acquisition and decoding. Mental health issues like stress; anxiety, depression and suicidal tendencies are common in people with Learning Disability. This impacts school and college education, employment/career opportunities and advancements. In India, approx. 10—15% of people is struggling due to LD.

Dr. Singh is a serial-entrepreneur with domain expertise in Biotechnology, Healthcare, and Education. He is now on a mission to use advanced technologies to make a difference in the lives of struggling readers. Dr. Singh will provide global insights on challenges due to Dyslexia and Learning Disabilities, an invisible disability with a strong association with stress, anxiety and suicidal tendencies and many other mental health issues. The presentation will simplify the neuroscience of reading brain, and the application of biotechnology and bioinformatics in the development of an advanced solution like ReadON.

Nanotechnology for disease prevention and management

Swasti Tiwari, Department of Molecular Medicine & Biotechnology, Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow-224014, India, Email: tiwari.pgi@gmail.com.

The field of molecular medicine came into existence when a high need was realized to bridge the ever-widening chasm between scientific discoveries and its clinical implementation. Some of the recent biological discoveries have given a tremendous boost to the development of molecular medicine-based approaches. The discovery of Extracellular vesicles, especially exosomes is one such example. Exosomes are small (<180 nm) spherical lipid bilayer that is released from the cells into the extracellular environment from a fusion of internal vesicles of multivesicular bodies to the plasma membrane. The presence of exosomes in the circulation has gained substantial research attention as a non-invasive source to study molecular-cargo of the originating cells. Besides, these nano vesicles could have a great impact on public health in the development of new therapeutic approaches due to their small size and superb biocompatibility. In my laboratory, we have carried out studies to demonstrate the usefulness of these vesicles in predicting human diseases. Very recently, we have initiated studies to explore the therapeutic potential of these vesicles as a safe alternative to existing strategies. In my talk, I will be sharing data from some of these studies.

1-Cys peroxiredoxin (AnPrx6) from *Anabaena* sp. PCC 7120: structure and function beyond expectations

Yogesh Mishra, Department of Botany, Centre of Advanced Study in Botany, Institute of Science, Banaras Hindu University, Varanasi, India-221005, E-mail: yogeshbhu@gmail.com; ymishra@bhu.ac.in.

Peroxiredoxins (Prxs) from a wide range of organisms have been studied extensively from both biochemical and structural perspectives. The Prx of bacterial origin are often referred to as alkyl hydroperoxide reductase subunit C (AhpCs). They are part of the antioxidant defense system that protects the organism against variety of reactive oxygen species. To date, little is known about the structure and function of cyanobacterial peroxiredoxins. Enhanced expression of the AhpC from the cyanobacterium *Anabaena* sp. PCC 7120 in *E. coli* increases the tolerance against multiple types of abiotic stresses, suggesting additional functions for AhpC. We have characterized Prx 6 from the cyanobacterium *Anabaena* sp. PCC7120 (AnPrx6-previously AhpC) for the first time and found that in addition to the expected peroxidase activity, AnPrx6 can also act as a molecular chaperone in its dimeric state, contrary to other Prxs. The AnPrx6 crystal structure at 2.3 Å resolutions reveals different active site conformations in each monomer of the asymmetric obligate homo-dimer. Molecular dynamic simulations support the observed structural plasticity. A FSH motif, conserved in 1-Cys Prxs, precedes the active site PxxxTxxCp signature and might contribute to the 1-Cys Prx reaction cycle. This is the first example of chaperone activity for any Prx/AhpC without decamer formation. The moon lightning property might have been crucial for survival of cyanobacteria in harsh environments over billions of years.

Photo-thermal modulation of kisspeptin-gonadotropin-releasing hormone signaling in the stinging catfish *Heteropneustes fossilis*

Radha Chaube, Department of Zoology, Institute of Science, Banaras Hindu University, Varanasi-221005, India, Email: chauberadha@rediffmail.com.

Kisspeptins (Kiss) are upstream regulators of gonadotropin-releasing hormone (Gnrh) in the brain, and this functional system is the major linking regulating pituitary gonadotropin (LH and FSH) secretion. In seasonally breeding vertebrates, extrinsic factors like photoperiod and temperature are the major determinants of the annual reproductive cycle. In the catfish *Heteropneustes fossilis*, *kiss 2* and *gnrh2* gene paralogs were isolated and characterized and mRNA expression in the brain was monitored to understand the Kiss-Gnrh signaling after altered photothermal conditions and after Melatonin (MT, a pineal hormone) treatment. The exposure of the catfish to long photoperiod (LP, 16 h light) or high temperature (HT, 28 °C) for 14 or 28 days stimulated both *kiss2* and *gnrh2* expression with higher expression on day 28 in both gonad resting and preparatory phases. The combination of LP and HT elicited maximal effects. Short photoperiod (SP, 8 h light) under normal temperature (NT) or HT suppressed the gene expression. Pineal MT, that mediates photo-thermal signals, inhibited brain *kiss2*and *gnrh2*gene expression in the NP + HT, LP + NT and SP + NT groups. The results show that environmental photoperiod and temperature modulate Kiss-Gnrh expression and MT has a critical role in modulating the functional status of the Kiss-Gnrh pathway in the regulation of gonadotropin secretion.

Achieving blue economy through marine Biotechnological Innovations

R. Kirubagaran, Retired Scientist-G & Head, Marine Biotechnology Division, National Institute of Ocean Technology, Pallikaranai, Chennai — 600100, Email: rk4523@yahoo.com.

India is bestowed with a long coastline of over 7500 KM and Exclusive Economic Zone (EEZ) of around 1.63 million KM^2 to attain economic richness by exploring its vast coastal and marine biodiversity. Although Marine Biotechnology is still in an infant stage in our country due to various reasons, the major constrains are due to lack of innovative technological approach in this field. The global conventional quest for food from ocean is now focussed towards many more novel molecules and materials especially from hostile extreme environments. The floral and faunal richness of the marine ecosystem is going to offer several bio-products for direct and indirect applications of mankind in the years ahead. In this context, the need of algal (microalgae and macroalgae) biomass generation, cultivation technologies for organisms from extreme environments, oceanic engineering for mass scale production of fin and shell fishes, identification of novel materials for screening and/or degradation of xenobiotics entering into the marine environment, etc. should be prioritised in our research and technology development approach.

Helicobacter pylori and gastric cancer: The Indian enigma

Uday C Ghoshal, Department of Gastroenterology, Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow, Email: udayghoshal@gmail.com.

Helicobacter pylori (*H. pylori*), a Gram-negative bacillus that colonizes human stomach, causes gastric cancer and mucosa-associated lymphoid tissue lymphoma; hence, it has been classified as a class I carcinogen. However, in some geographical regions such as Africa, in spite of a high prevalence of *H. pylori* infection, a low prevalence of gastric cancer has been reported and this has been called "The African Enigma". Similar phenomenon has been observed in other geographic areas such as India and we named it as "The Indian enigma". The mechanisms behind these enigmas may include host genetic differences, pathogenic potential of infecting *H. pylori* strains, and dietary and environmental factors. For example, whereas some dietary components (onion, turmeric, fresh fruits and vegetables) are known to protect against gastric cancer, others (salt, fish, meat, and rice) may increase the risk. Understanding the occurrence and mechanisms of such enigmas are of great importance as knowledge on these may help planning preventive strategies against this deadly disease in areas of the World where it is common. Though eradication and prevention of the infection either by environmental measures and vaccination are the other strategies to prevent gastric cancer development, modification in diet may be an alternative approach. This is an interesting area for further research.

Significance of mitochondria and ER in the genesis of metabolic syndromes

K. G. Raghu, CSIR - National Institute for Interdisciplinary Science & Technology (NIIST), Thiruvananthapuram - 695019, India, Email: raghukgopal2009@gmail.com.

Mitochondria and endoplasmic reticulum are very important organelles and nutrient sensors, and their dysfunction has been extensively and independently implicated in metabolic diseases. Considering the importance of mitochondria in the genesis of metabolic syndrome, studies were conducted to link changes on various parameters of mitochondria like integrity, dynamics and OXPHOS during insulin resistance. Results revealed that during insulin resistance mitochondrial transmembrane potential, permeability transition pore, proteins of ETC complexes such as complex I, II III and fission and fusions proteins (FIS1 and OPA1) are affected significantly. Endoplasmic reticulum (ER) stress is an emerging potential therapeutic target for metabolic syndrome due to its role in synthesis, secretion, and folding of proteins. It leads to an increased production of reactive oxygen species (ROS), which, along with mitochondrial dysfunction and reduced antioxidant defense, causes chronic cell injury. ER stress was induced in mature 3T3-L1 adipocytes by treating them with tunicamycin (2 μg/ml) for 18 h. Likewise marker proteins of ER were studied during insulin resistance and found there is significant change in the expression of various essential functional protein. Alterations in innate antioxidant system (superoxide dismutase, glutathione peroxidase, and glutathione reductase), and inflammatory cytokines (tumor necrosis factor, monocyte chemoattractant protein, interferon-γ, interleukin (IL)-10, IL-6, and IL-1β) during ER stress were analyzed. Measuring adiponectin and leptin secretion levels also assessed endocrine function of adipocytes. Overall results revealed that mitochondria and ER are affected severely during insulin resistance.

Insect inducible expression of PME in plants for broad spectrum insect resistance

Praveen Chandra Verma, Plant Molecular Biology and Genetic Engineering Laboratory.

CSIR- National Botanical Research Institute, Lucknow — 226001, Uttar Pradesh (India), Email: praveencverma@nbri.res.in.

Plant cell wall plays a major role in defense mechanism against biotic and abiotic stress, as it constitutes the physical barrier between the microenvironment and internal component of the cell. As emitted methanol is toxic to the insect pest, we demonstrated that overexpression of *PME* gene resulted in to higher methanol production and emission, thus imparting resistance to the group of insects. We further over expressed the *WsPME* gene under the insect inducible promoter, which causes enhancement of methanol production at the time of insect attack; this provides better insect resistance property to the plant. We found 10—15 folds enhanced methanol content and emission level at different inducible time point interval (15min, 30min, 45min, 60min) which causes 85—90% mortality caused by transgenic tobacco in both chewing (*Spodoptera litura* & *Helicoverpa armigera*) and sap-sucking (Aphid, mealybug & whitefly) pest. This technology will not have any limitations like biosafety, environmental concerns, public acceptance and protection against limited number of insects.

My reflections in biotechnology and emerging topics in biomedicine

Krishnarao Appasani, Vice-Chairman & Chief Executive Officer, Science City of Andhra Pradesh, Govt. Of Andhra Pradesh, AP Secretariat, Bldg. 4, Room 170, Velagapudi - Amaravati, AP, India, Email: ceoapsciencecity@gmail.com.

While I was nine years old, it was a great coincidence for me to read for the first time the name of Dr. Har Gobind Khorana in the news while he got the Nobel Prize in 1968. Since then 'I had a dream to work with him and to take his legacy further in to the society'. In another incident, during my doctoral studies at Banaras Hindu University, I had an opportunity to meet him in person for the first time in 1983 at the 'International Congress of Genetics' Conference in New Delhi. After, eight years (1991), I was fortunate to be associated with him 'to make my dream real,' and lucky to join his stellar group of global young minds to work on membrane protein biochemistry and synthetic biology. My first part of the talk will emphasize on my dream to do 'great science' and how I prepared my path to lead into a reality. I will accentuate on the genesis of molecular biology and/or biotechnology in India and my role from its beginnings. Second part of talk will describe on my passion of doing 'cutting-edge science' at Tufts, MIT and Harvard (all in USA) especially in the areas of Gene Expression, Regulation & Signal Transduction. Third part of my talk will focus on becoming an entrepreneur then by connecting academic scientists and industry executives especially by developing 'Meeting the Minds' (i. e brilliant minds in the world) approach and interacting with them to promote 'Global Science Education' for a period of 15 years. Fourth part of talk highlights my inner instinct of coming back home after 30 years of my American life and re-engineers my life in India. While I was in Dr. H. Gobind Khorana's lab, many times he had insisted me to take up a job in India like many of his earlier colleagues. Because of personal and immigration reasons, I did not pass his request, stayed in USA and became a 'scientist-turned entrepreneur.' However, this was resonating in my mind all these years but never ever decided or thought to come back to India. In 2014, in a coincident meeting with member of the India's Prime Minister's Cabinet, Union State Science & Technology and Earth Science Minister, we laid a strategic plan to build science cities across the nation, and the first one should be launched in the state of Andhra Pradesh where we both are officially born. At the last, I will outline my vision to develop 'multi-crore rupees mega-science project' - 'Andhra Pradesh Science City Infrastructure,' its emphasis on Biotechnology and underline on the emerging topics in biomedicine.

Resolving the infection and inflammation by targeting chemokine-glycosaminoglycan mediated leukocyte migration

Krishna Mohan Poluri, Department of Biotechnology and Centre for Nanotechnology, Indian Institute of Technology Roorkee, Roorkee 247667, Uttarakhand, India, Email: mohanpmk@gmail.com/krishfbt@iitr.ac.in.

Microorganisms such as bacteria, viruses, and fungi cause infections. Hosts fight infections using their innate and adaptive immune system. Chemokines are a group of chemotactic cytokines that are involved in regulating leucocyte migration to the infected tissue. They do so by binding to glycosaminoglycan's (GAGs) on the endothelial cell surface and thus activating the G-protein coupled receptors (GPCR) present on the leucocytes. Neutrophil activating chemokines (NACs) are one of the major classes of CXC chemokines recognized by their highly conserved "ELR" motif that recruit neutrophils at the site of infection. Growth related Oncogene (GRO) chemokines, subfamily NACs, consisting of three members CXCL1 (GRO-α), CXCL2 (GRO-β) and CXCL3 (GRO-γ). The current study details the formulation of novel GAG based synthetic molecules (GAG-Mimetics) for regulation of chemokine mediated leukocyte trafficking. Molecular studies using chemical biology techniques with synthetic GAG molecules and GRO Chemokines suggest that these synthetic sulfated carbohydrate scaffolds are specific in binding to chemokines and can compete with the natural GAGs such as heparin. Further, this study promises to aid in creation of chemokine and GAG based decoys to circumvent the endogenous GAG based chemokine recruitment in numerous infectious/inflammatory diseases.

Genomics and bioinformatics intervention in plant biotechnology: a current perspective

Dinesh Yadav, Gene Cloning and Expression Lab, Department of Biotechnology, D.D.U. Gorakhpur University, Gorakhpur (U.P.) 273 009, E-mail: dinesh_yad@rediffmail.com.

Substantial efforts are being made to attain food and nutritional security globally using conventional plant breeding, molecular breeding, transgenic, genomics and bioinformatics approaches. Developing suitable crop varieties with enhanced yields is a major challenge for agricultural scientists under several constraints emerging from increasing population, urbanization, industrialization, climate change and shrinkage of arable lands. Technological innovations in agriculture are being witnessed as an important development for achieving the target to feed the growing population globally. Agriculture biotechnology has great potential to deliver and in the recent years the deciphering of genome sequences of several crops like rice, wheat, sorghum, pigeon pea, chickpea, tomato, millets etc. resulted in effective evaluation of potential genes/markers/transcription factors associated with desirable agronomic traits. Efforts are being made by Department of Biotechnology, Govt. Of India on several thrust areas focusing on genome sequencing, identification of novel genes, QTLs, marker aided selection for addressing problem of abiotic and biotic stresses and also promoting nutritional quality traits in staple crops. The recent advances in plant biotechnology owing to deciphering of genome sequences resulted in exponential growth of sequence data and needs development of appropriate bioinformatics tools for proper storage, retrieval and analysis. The bioinformatics research is presently associated with development of new algorithms and statistics to assess relationships among members of large data sets; analyses and interpretation of various types of sequences, domains, and structures; and development and implementation of tools that enable efficient access and management of different types of information. Genome-wide bioinformatics based assessment of sequenced plant genomes has resulted in understanding the complexity of plant genomes and provides an opportunity to access the genes associated with desirable agronomic traits. In our lab, efforts are being made to study transcription factor gene families especially Dof (DNA binding with One Finger) and NF-Y (Nuclear Factor-Y) using tools of bioinformatics and molecular biology. For the first time, the sequenced genomes of sorghum, pigeon pea and chickpea annotated for deciphering the *Dof* gene families revealed 28, 38 and 37 *Dof* genes respectively. Molecular cloning, sequencing and real time expression profiling of many of the predicted *Dof* genes of these crops has been performed showing potential for developing abiotic and biotic stress tolerant crops.

Advancements in the delivery of drugs by using nanoparticles

Chandra Kant Sharma, Professor and Head of Institute (HoI), SAGE University, Indore, M.P.-452020, Email: ck21sharma@gmail.com.

Biosynthesis of metallic nanoparticles has attracted nowadays, it will revolutionize the field of medicine by creating new therapies. Nanoparticles may be defined as the nano, dwarf and solid particles with size 1—100 nm in diameter. NPs are grouped into two categories-organic and inorganic. Organic NPs includes semiconductor NPs, magnetic NPs and novel metal NPs (copper, gold, silver). Various conventional methods are available for the fabrication of the NPs like as chemical method, physical method and biological method. It is found that the plant mediated metal ions has quick reduction rate in comparison to microorganism and in stable production of metal nanoparticles. By changing the pH, the size and shape of plant mediated synthesized nanoparticles can be modulated and controlled. Chemical and physical methods for the synthesis of nanoparticle are expensive, time taking and harmful in comparison to biological method because it is (biological method) environment friendly, takes less time, cheaper and easy to synthesize. The usage of plant product in Nanobiotechnology has excessively developed in the current years. It is expected to fulfill the purpose for targeting, detecting and treating in various diseases. Successful therapy and present diagnosis are very important to enjoy a healthy life when suffering from the diseases. Nanotechnology has the application where the matter may be control at the molecular level. Aptamers may call as the multi-talented molecule. The polymeric nanoparticles have high mobility in the smallest capillaries permit the efficiency of uptake and accumulation of selective drug at the targeted sites for therapy of cancer. The important role is played by nanotechnology in many more technologies. Current progress has opened up applied frontiers and novel fundamental in engineering and materials science in nanotechnology. It is focused on the recent success in the development of drug delivery and targeted drug delivery with the help of polymeric nanoparticles for an efficient anti-cancer therapeutics.

Neuroendocrine control of reproduction: role of kisspeptins

K. P. Joy, INSA Emeritus Scientist, Department of Biotechnology, Cochin University of Science and Technology, Kochi - 682022, Kerala, Email: kpjoybhu@gmail.com.

Kisspeptins (Kiss) are products of the tumor metastasis suppressor gene *KISS1* in melanoma cells. The gene encodes a precursor protein that cleaves proteolytically, producing biologically active smaller peptides (54, 14 or 13 amino acids in humans) with a common 10 amino acids sequence in the carboxy terminus. The 54 amino acids peptide, formerly known as Metastin and now renamed as Kisspeptin, inhibits migration of cells in cancers. Kiss belongs to the RF amide peptide family that is characterized by R (arginine) and an amidated F (phenylalanine) as the last two amino acids in the C-terminus. Kiss mediates its action through GPR-54 or KiSS1R, formerly identified as an orphan receptor. Mutations of GPR54 were associated with idiopathic hypogonadotropic hypogonadism in patients. This discovery has led to the association of kisspeptins with reproductive functions and introduced a paradigm shift in the regulation of reproduction in vertebrates. Kiss is involved in the control of reproduction, a major role is in the upstream regulation of gonadotropin-releasing hormone, once thought to be the critical molecule in the regulation of gonadotropins (LH and FSH). Interestingly, Kiss genes and proteins are represented throughout the vertebrate history with one or two functional paralogs or isoforms (*kiss 1* and *kiss 2*/Kiss 1 or Kiss 2) and the evolutionary history is marred by differential losses and retentions. Teleost fishes have either both Kiss1 and Kiss2 or only Kiss2 functional peptides. In catfish, we cloned and characterized the *kiss2* gene and its expression was modulated by external (light, temperature) and internal (steroid feedback) environmental factors in the regulation of Gnrh. Future research should address the translational value of the peptides in therapeutics and aquaculture biotechnology.

Glutamate excitotoxicity in cerebellum as a long term consequence of neonatal hypoglycemia

Anju T R, Molecular Neurobiology and Cell biology Unit, Centre for Neuroscience, Department of Biotechnology, Cochin University of Science and Technology, Cochin-682 022, Kerala, India, Department of Biotechnology, Newman College, Thodupuzha — 665 585, Kerala, India. Email-anjutr@newmancollege.ac.in; anjutr@gmail.com.

Low blood glucose level in newborn period, in isolation as well as when associated with other morbidities, predisposes to long-term neurological damages. Animal studies suggest that hypoglycemia causes brain injury via multiple mechanisms, which include excess glutamate, an excitatory amino acid neurotransmitter, free fatty acid release and increased mitochondrial free radicals. The current study was focused on evaluating the long term consequences of neonatal hypoglycemia in cerebral cortical functions by studying the alterations in glutametergic pathways at the level of neurotransmitters and receptors along with the antioxidant enzyme kinetics in one-month-old rats exposed to neonatal hypoglycemia. We observed a significant reduction in antioxidant enzyme kinetics indicating reduced free radical scavenging capability. The increased glutamate content and GDH expression with down regulated GLAST and GAD expression points to glutamate mediated excitotoxicity in the cerebral cortex of one month old rats exposed to neonatal hypoglycemia. The receptor binding studies and gene expression of receptor subtypes also point to the same fact. The alteration in the crucial signaling pathways in a later stage of life induced by an early life stress is to be considered with great care as this may trigger the onset of many disease conditions in the adult stage.

Role of extracellular matrixon neuronal regeneration

Naijil George, Department of Biotechnology, St. Joseph's College (Autonomous), Irinjalakuda - 680 121, Thrissur Dist., Kerala, India. Email: naijil@stjosephs.edu.in.

Extracellular matrix (ECM) of the central nervous system has a major role in providing both structural support and modulating intercellular communication. The composition of central nervous system ECM is unique, comprised of a hyaluronan backbone to which is attached chondroitin sulfate proteoglycans of the lectican family, along with tenascins. Sulfated glycosaminoglycans (GAGs) in the ECM are known to play an important role in axonal outgrowth and regeneration in neurodegenerative diseases and after central nervous system injuries. Arylsulfatase B (ARSB or Naglazyme) is a N-acetylgalactosamine 4-sulfatase present in endosomes and lysosomes of cells, which removes the 4-sulfate from the non-reducing ends of dermatan sulfate and chondroitin sulfate. 4-Sulfated GAGs are upregulated after neuronal injury and inhibit axonal outgrowth. Overexpressing ARSB in astrocytes results in increased neurite outgrowth of co-cultured neurons. In contrast, silencing of ARSB expression in astrocytes using siRNA reduced the neurite length in co-culture models. Pre-treatment of astrocytes through the addition of exogenous ARSB leads to increased neurite length of co-cultured mouse hippocampal neurons, however this effect is only seen in the co-culture and disappears when neurons alone are cultured and treated. These results show that ARSB treatment can alter astrocyte-neuron interactions and initiate changes that result in increased neurite growth. This may be due to ARSB modifying secreted GAGs or growth signals produced by astrocytes to promote neurite outgrowth or create a more permissive environment through alteration of the extracellular matrix. Further understanding of this enzyme and the role of GAGs and their sulfation in the growth of neurons may lead to novel strategies or therapeutic targets to aid neuronal regeneration in neurodegenerative diseases and after CNS injury.

Abstracts of oral presentations

Session-I: industrial biotechnology

OP 1: Theoretical approaches to understand elastic properties of DNA

Karishma Sharma, Research Scholar, LNM IIT, Email: ks3279064@gmail.com.

DNA, Protein, carbohydrates and lipids are four major types of macro-molecules that are essential for all known forms of diversity of life. Deoxyribonucleic acid (DNA) is a bio molecule composed of two chains that are made up of nucleotide (A, T, G, C) twisted around each other to form a double helix and the helix is kept stable by hydrogen bonds, which can be found between the bases attached to the two strands. For this we need to well understand the active biological processes like transcription, replication, DNA repair and DNA packaging along with encounter bent DNA. The molecular machinery that is associated with this biological system interacts with DNA at a certain short length scale range. The size of human cell nucleus of dsDNA, which is nearly 1.8 m in length scale of base pairs that forced the DNA to bend and stretch at a length scale of 10 base-pairs. There is some Elastic base —pair manipulations during the process like transcription where DNA helicases must generate forces to unzip parental strands during replication that result in difference in stability between base-pairs. We need to focus upon elastic properties related to DNA stretching and bending because twisting of DNA can lead to other structural transition where DNA is modeled as an elastic rod along with its mechanical property is well understood by the concept of WLC (worm like chain model) that defines information of persistence length of long DNA fragments. To calculate these elastic properties we can use different theoretical approaches of microsecond MD simulation. These approaches give us information about all atoms and different methodology for calculating elastic properties of DNA. We can perform this kind of study which helps us to understand elastic properties of DNA which can be sequence dependent or sequence independent for duplex DNA fragments along with study of helical structure defines its persistence length that changes during the difference in applied force in different solvent such as explicit solvent or implicit solvent. The use of different force field that result in changes in stretch modulus, bend angle distribution, contour length and radial distribution in case of short fragments of dsDNA and comparing structural property of dsDNA with previous long stranded fragments of DNA that has been performed earlier through these steps.

OP 2: Biofuel profiling of micro-algae of polluted habitats of Meerut and adjoining areas

Jyoti Singh, Sunil Kumar, Neha, Nida Ziyaul & Rama Kant *, Department of Botany, Chaudhary Charan Singh University, Meerut, India 250004, * Email: ramakant.algae@gmail.com.

Microalgae have long been recognized as potentially sources for biofuel production because of their relatively high oil content and rapid biomass production. It also has unique importance to reduce gaseous emissions, greenhouse gases, climatic changes, global warming receding of glaciers, rising sea levels and loss of biodiversity. Microalgae can grow very fast as compared to terrestrial crops and plants. The practice of algal mass culture can be performed on non-arable lands using non-potable saline waste water. Oil content of microalgae is commonly between 20% and 50% while some strains can reach as high as 80%. This is why microalgae are focused for biofuel area. Algal biofuels may give a viable alternative to fossil fuels. The microalgae, like *Oscillatoria, Spirullina, Anabeana, Nostoc, Cylindospermum* and *Lyngbya* sp., have high oil content. Algae contain approximately 30% oil by weight which is huge compared to other bio-fuels. Biodiesel has gained much attention in recent years due to its eco-friendly nature, non-toxic characteristics, biodegradability and lower net carbon cycle compared to conventional diesel fuels. In the current study, potential algal species *Oscillatoria* and *Lyngbya* were collected from different sites of Meerut city and employed as a feedstock for biodiesel production.

OP 3: Cell free system; innovative techniques producing therapeutics protein

Saif Mohammed & Saleh Ansari*, Department of Biochemistry & Biochemical Engineering.

Sam Higginbottom University of Agriculture, Technology and Sciences, Email: ansarisaif0091@gmail.com.

Cell free systems allowing a practical and flexible concern the advantages of power of synthetic biology and offer an alternative program for next generation protein expression, protein bio manufacture and metabolic study in lack of cellular membrane and functional genome. The in vivo or cell bounded protein production usually demanding great resources and long time for development. The biosynthesis pathway beyond the cell holds outstanding perspective to create affordable and time consuming in vitro system or cell free system for the rapid synthesis usually takes few hours. This system includes, limit mass production of desired natural products of interest following high costs of protein purification, protein degradation, longevity of reactions, and ability to scale and high throughput potential etc. In addition, flexibly parallel precursors are allow to added to reaction in cell free system and development of natural highly efficient and novel products. The major impact of cell free system is to increase the production of therapeutic protein. Therapeutic proteins can cure from various immune-deficiencies disease and cancer. The application of cell-free protein synthesis has made the most impact study on structure and function because of which large number of purified proteins analyses shortly. Commercial cell-free protein synthesis are developed from a variety of material sources including extract from *E. coli*, archaeal to recent insect, plant, human and cell lines resulting yields of proteins. Another infatuated interest in Cell free protein synthesis techniques advantages for the production of recombinant proteins, vaccines, membrane proteins, synthesis natural occurring macromolecules, bio-devices, cell free genetics network and many more application in the cell free system fields will leads in to future. This article provides a brief introduction of cell free system for protein synthesis and describes the source and applications of this important technology.

OP 4: UV sunscreens from cyanobacteria — a biotechnological aspect

Rajesh P. Rastogi, Ministry of Environment, Forest & Climate Change, National Natural Resource Management System (NNRMS)-Research in Environment (RE) Division, Indira Paryawaran, Bhawan, New Delhi-110003, India, E-mail: rp.rastogi@gov.in.

Ultraviolet (UV) radiation reaching the Earth surface is one of the biologically harmful components of solar light that may affect nearly all life-forms ranging from humans to microorganisms. Solar UV radiation (mainly UV-B: 280—315 nm) can damage key cellular machinery such as DNA and proteins, either directly or by oxidative stress attributed by reactive oxygen species. To withstand the detrimental effects of solar UV-B radiation, several organisms have developed certain resilience mechanisms during the course of evolution. Biosynthesis of UV-sunscreen molecules is considered an important photoprotective mechanism in diverse groups of microorganisms. Biosynthesis of natural photoprotectant biomolecules by different microorganisms including cyanobacteria has impelled worldwide interest in search of natural sunscreen molecules. Cyanobacteria are known to produce certain UV-absorbing molecules such as mycosporine-like amino acids (MAAs) and scytonemin (Scy). Both MAAs and Scy have great efficacy to photoprotect from harmful doses of solar UV radiations by dissipating the absorbed energy in the form of heat without any further metabolic investment. Moreover, due to their potential UV-absorbing/screening capacity as well as several medicinal properties, MAAs and scytonemin may be biotechnologically exploited by various pharmaceutical and cosmetic industries. Overall, UV absorbing secondary compounds from cyanobacteria can be interesting and promising options for the production of natural sunscreens, which may trigger remarkable output towards global cosmeceutical sectors.

OP 5: Optimization of process parameters for an efficient biofuel production from coconut shell biomass by Taguchi approach

Prashant Katiyar, Shailendra Kumar Srivastava* Department of Biochemistry and Biochemical Engineering, Sam Higgin Bottom University of Agriculture, Technology and Sciences (SHUATS), Allahabad-211007, *Email: katprashant27@gmail.com.

Recently, the growing awareness of environmental issues has focused attention on the need for greener and more sustainable technologies of chemical industries is Ionic-Liquids (ILs).

The ionic liquid technology in biomass processing is relatively recent one and focused on the lignocellulose biomass dissolution through the ionic-liquids (ILs) such as1-ethyl-3methylimidazolium acetate [BMIM][COO^-] and 1-butyl-3-methylimidazolium chloride [BMIM][Cl^-]. Ionic-liquids are able to disrupt the plant cell wall components by lignin solubilization and reduction in cellulose crystallinity. The goal of present study is to evaluate the best biomass candidate and the most influential parameters employed temperature, time and water concentration after pretreatment with aqueous-ionic liquid technology for biofuel generation by Taguchi approach. Here, in this present study, the main emphasis was on aqueous-ionic-liquid technology where water and ionic-liquids (ILs) mixture are made under vacuum and utilized for the coconut shell biomass fractionation. An observed TRSyield was 46.6% and 36.25498% residual lignin was found in a S-12 [BMIM][COO^-] at 120 °C for 2.5 h under vacuum conditions. Here, in an aqueous-ionic-liquid technology, distilled water was used as an anti-solvent for biomass fractionation. The Taguchi approach finds the most significant factor was water concentration (wt%) instead of other parameters such as temperature and time and the most effective biomass was S-12 [BMIM][COO^-] as compared to K-12[BMIM][COO^-] are suitable for biofuel generation but the rest S-12 [BMIM][Cl^-], K-12[BMIM][Cl^-] are not suitable.

OP 7: Low cost production of glucose oxidase enzyme by using bacterial strains

Sujeet Pratap Singh[1]*, Dinesh Raj Modi[2], Rajesh Kumar Tiwari[1] [1]Amity Institute of Biotechnology, Amity University Uttar Pradesh, Lucknow Campus, Lucknow-226028, [2]Department of Biotechnology, Dr. B R Ambedkar Central University, Lucknow-226025, Uttar Pradesh, India, *Email ID: spsingh3@amity.edu.

Glucose oxidase catalyzes the oxidation of β-D-glucose to gluconic acid with the formation of H_2O_2. It is mostly used for measuring glucose concentration and its application in immobilized form is preferred. Glucose oxidase enzyme is being extracted from *Aspergillus niger* and other fungal resources till date and Glucose oxidase (GOX) from *Aspergillus niger* is a well-characterized glycoprotein. For commercial production there must be other sources to be identified and there is no well-known bacterial source available currently. The need is to identify the suitable bacterial source capable of producing GOX in good quantity. Then the production can be scaled up to the commercial level for maximum yield. This will certainly reduce the cost of GOX and make it available at cheaper rate than what is available in market. This approach of finding new and novel bacterial source is essential because of the following reasons: a) Bacteria has a short doubling time and more of yield can be produced in less time b) The overall fermentation time may be reduced c) In using fungi, its downstream processing (DSP)) is difficult because of the mycelium present whereas if bacterial source found then it would be easier d) Since DSP cost would be reduced, the overall cost of the GOX enzyme would be reduced finally. So there is an urgent need to identify and characterize the new bacterial source for commercial production of Glucose oxidase enzyme.

Session-II: Medical Biotechnology

OP 1: *In-silico* approach for identification of potential anti-tubercular properties in *Tinospora cordifolia*

Devvret Verma[1], Shivangi Solanki[1] and *Kumud Pant[1], Vikas Tripathi[3] and Ashish Thapliyal[2]

[1]Department of Biotechnology, [2] Life Sciences and [3]Computer Science, Graphic Era Deemed to be University, Dehradun, Uttarakhand, India. *Email: solankishivangi49@gmail.com.

Since decades after the discovery of the causative agent *Mycobacterium tuberculosis*; Tuberculosis (TB) remains a leading cause of death worldwide. Bedaquiline is a recent drug which came in the market after passing the rigorous phase of clinical trials. It is a diarylquinoline derivative which inhibits ATP synthase. ATP synthase is an enzyme which is involved in optimum growth and metabolism of *Mycobacterium tuberculosis*, thus ATP synthase is a potential drug target for TB. The drug resistance towards the Bedaquiline is an alarming situation and to fight against this we need to identify potential inhibitors against TB. In traditional practices, the herbal medicinal plant *Tinospora cordifolia* was used to cure many diseases for example leprosy, anemia, jaundice, diabetes. The plant mainly contains alkanoids, glycosides, steroids, and many aliphatic compounds. In the current study we have performed in-silico analysis of phytocompounds present in *Tinospora cordifolia*. Docking analysis and ADMET property prediction were done for assessing the efficacy of potent inhibitor of ATP synthase. The results indicate that the Cholic acid, 2-Hydroxy-3-oxoicosanoate and 6,9,12,15-Octadecatetraeno atato are the compounds which shows the high affinity against ATP synthase subunit ε. Moreover, the pharmacokinetics, lipophilicity, water-solubility, drug-likeness and toxicity of these compounds have been analyzed using ADME swiss and protox server. The results indicate that 2-Hydroxy-3-oxoicosanoate fulfill all the criteria to be a potent drug to inhibit ATP synthase subunit ε. The study suggests that 2-Hydroxy-3-oxoicosanoate have anti-tubercular property which can be further validated in In-vitro.

Keyword: Tuberculosis, Docking, ADMET, *Tinospora cordifolia*.

OP 2: Genetic polymorphism of glutathione S-Transferase M1, T1 and P1 genes and susceptibility to vitiligo disease

Daya Shankar Lal Srivastava[1], Kamal Aggarwal[2] and Anil Kumar[3], [1] Department of Biochemistry, [2]Department of Skin

& VD, Pt. B.D. Sharma PGIMS, Rohtak, [3]Department of Medical Biotechnology, M.D. University Rohtak, India-124001, Email ID: dshankarpgi@yahoo.com.

Vitiligo is a multifactorial polygenic disorder of the skin. It is characterized by a white pigmented patches due to dysfunction of the melanocytes. Increased oxidative stress and resulting inflammation in the epidermal layer of affected skin has been emphasized in this disease. Glutathione S-transferases (GSTs) are a multi-gene family of enzymes that are important in protection against oxidative stress, inflammation, mutagenicity and genotoxicity. Polymorphisms of specific subtypes of GST enzymes (GSTT1 and GSTM1 genes) may lead to an imbalance in pro- and anti-oxidant systems with ensuing increased production of reactive oxygen species that may influences the pathogenesis of vitiligo. The aim of present study was to examine whether variant genotypes of GSTM1, GSTT1, and GSTP1genes are risk factors for susceptibility of vitiligo. In the present study, we assessed 194 patients with vitiligo and 340 healthy individual as a controls, all from North India. Genomic DNA was extracted from human peripheral blood by using phenol chloroform method. The GSTT1 and GSTM1 null genotypes were identified by multiplex polymerase chain reaction (multiplex PCR) whereas GSTP1 Ile/Val genotypes were identified by PCR-RFLP method and data analysis was done by SPSS 20.0 software. In present study, we observed a significant higher risk with null allele of GSTT1 (OR = 1.52; 95%CI = 1.05–2.04; $P = 0.027$) for the vitiligo disease. We also observed a trend of association with null alleles of the GSTM1 (OR = 1.42; 95% CI = 1.05–1.34; $P = 0.054$); however, no associations were established with Ile/Val, or Val/Val genotypes of GSTP1 ($P = 0.690$) as compared to controls. In combined analysis of two risk genotypes, show a further risk of vitiligo only with null allele of GSTM1 and GSTT1 genotypes (OR = 2.32; 95% CI = 1.25–4.32; $P = 0.006$) as compared to positive allele of these genes. The null alleles of GSTT1, is strong predisposing risk factors for vitiligo in North India. Our study shows the existence of an association between Vitiligo and the null genotype of GSTM1 and GSTT1 and warrants further investigation on a large epidemiological study.

OP 3: A study on the malondialdehyde and antioxidant enzymes in human blood samples

Vaishnavi Singh, Vaibhavi Singh, Yadavendra Sahi, Sayali Mukherjee and Sonia Chadha, Amity Institute of Biotechnology, Amity University Uttar Pradesh, Lucknow Campus Lucknow – 26028, India (AIB Communication No. AIB/2019), Email: vaishnavisingh1209@gmail.com.

Free radicals are molecular species which have an unshared electron and so attack on the macromolecules like protein, nucleic acid and lipids and causes protein damage, lipid peroxidation and DNA damage. Cellular damage caused by free radicals plays an important role in various pathological conditions. Antioxidant enzymes are involved in neutralizing these free radicals. There are various naturally occurring antioxidants – both enzymic as well as non-enzymic which counteract the action of cellular oxidants. A disbalance in the levels of free radicals and antioxidants leads to oxidative stress. The objective of the present study was to study the levels of malondialdehyde and antioxidant enzymes in the plasma isolated from blood of normal healthy individuals. Blood was collected in sodium citrate (0.129 M, pH 6.5, 9:1 v/v). Diluted blood was carefully layered onto HiSep gradient and plasma was collected. Estimation of Catalase (CAT) enzyme activity was estimated spectrophotometrically using H_2O_2 as substrate and is reported as μM of H_2O_2 utilized per minute per ml of plasma. Glutathione-s-transferase (GST) activity was measured spectrophotometrically by measuring the conjugation of glutathione with CDNB (1-chloro- 2,4-nitrobenzene). MDA levels were estimated by analyzing the colour produced by the reaction of MDA with thiobarbituric acid and were found to be 0.0482 nmoles/ml of plasma. The GST activity in plasma was found to be 0.0095IU/ml and the CAT activity was found to be 0.041 μmoles of H_2O_2 utilized/min/ml plasma.

OP 4: The nutrient profile of beetroot changes with maturity: implications in the prevention of diseases

Shikha Srivastava[1] & Lakshmi Bala[2], [1]Department of Food and Nutrition, Era's Lucknow Medical College, Lucknow, India [2] Department of Biochemistry, Babu Banarasi Das University, Lucknow, India, Email: shikhasrivastava.dietician@gmail.com.

Beetroot is being considered as the promising therapeutic treatment on a variety of clinical pathologies which are associated with oxidative stress and inflammation. It contains betalains pigments which show potent antioxidant, anti-inflammatory, and chemo-preventive effect. To best of our knowledge, there is no study available who address the effect of different maturity stages (60, 80 and 100 days) of beetroot on its nutrients, anti-nutrient and pigments composition. The study available on different maturity stages of beetroot leaf. Aiming at evaluating the different maturity stages of beetroot for moisture, ash, carbohydrates, vitamins, minerals, pigments and anti-nutrients for their use for the treatment of different diseases. The beetroot of different maturity stages was analyzed by conventional method at r-frac and by NMR was performed by CIMAP. Our data show that beetroot at 60 days of maturity had significantly ($p < 0.05$) highest content of folate, choline, vitamin C, betanin, and betaine but the content of carbohydrates, potassium, magnesium, phosphorus, saponins and oxalic acid were significantly highest at 100 days of maturity. This study proves that at different stages of maturity the nutrient content of beetroot were changed. So according to the need of nutrient, we can use different maturity stages of beetroot.

OP 5: Malnourishment as a compounding factor in the aggravation of toxic responses of monocrotophos (MCP): an in-vitro study

Puneet Khare[1, 2], & Laxmi Bala[2], [1]Flow Cytometry Facility, Central Instrumentation Facility, CSIR- Indian Institute of Toxicology Research, VishvigyanBhawan; 31, Mahatma Gandhi Marg, Lucknow, U.P. [2]Department of Biochemistry, College of Dental Sciences, BabuBanarasi Das University, BBD City, Faizabad Road, Lucknow, U.P. Email: khare.khare50@gmail.com.

Malnutrition is the state of lacuna in the nutritional makeup of our regular diet. The effect of malnutrition depends mainly on the factors viz., duration of malnutrition, type of nutritional constituent lost and the amount of nutritional ingredient. Any alter in the nutritional status leads to an effect on cellular physiology. The toxic insults are extremely used in agriculture for increasing the agriculture yield per capita. The large group of the population got exposed occupationally or by other means due to these toxicants. These exposure groups include malnourished as in well-nourished populations. The ranges of nutritional disarray are the outcome of malnutrition across the globe, especially in developing countries. The interrelationship between nutritional status and toxicant is complex and little studied. Our study is aimed to reveal the role of malnutrition in the toxicity of any toxicant. Initially, the suitable malnutrition condition of A549 and HaCaT cells were screened by keeping the cells in serum-free media. After that, the A549 and HaCaT cells were exposed to various concentrations (50 μM, 100 μM, 200 μM, 400 μM) of monocrotophos (MCP), an organophosphate pesticide, for the period of 24 h. The various toxicological endpoints, for instance, ROS generation, apoptosis, changes in cell cycle and Micro Nuclei assay of exposed cells have been detected utilizing Flow cytometry. Our In Vitro data concludes the elevated toxicological effects in simultaneously exposed malnutrition and toxic insult sample compared to nutritious experimental control. Thus, our findings recommended that the availability of a nutritious diet should augment to shrink the malnutrition state and to also diminish the exposure effects of toxic insults.

OP 6: Molecular and serological studies for detection and identification of yellow mosaic virus and soybean mosaic virus infecting soybean in Satna district

Jyoti Pandey[1] & Rajesh Garg[2], [1]Department of Biotechnology, APS University, Rewa (M.P.) [2]Department of Biotechnology, PG College, Satna (M.P.), Email: jyotipandey0102@gmail.com.

Yellow mosaic disease caused by Yellow mosaic virus in legume crops (Soybean). Yellow mosaic virus belongs to Begomovirus genus and Geminiviridae family is transmitted by the whitefly (*Bemisia tabaci*). Soybean mosaic virus belongs to potyviridae family. Soybean (*Glycine max* L.) is one of the most important sources of edible oil and proteins. It is found in study that Madhya Pradesh is a large soybean producer. It is frequently attacked by many devastating mosaic viral diseases. The aim of this study is based on identification and characterization of causal organism for the soybean viral diseases. Yellow mosaic virus (YMV) and soybean mosaic virus (SMV) cause annual yield loss of 80—90% in Madhya Pradesh. A total number of 50 samples of infected soybean plants showing mosaic, deformation and leaf roll symptoms were collected from soybean fields. The Double Antibody Sandwich-Enzyme-Linked Immunosorbent Assay (DAS-ELISA) and Antigen Coated Plate-ELISA (ACP-ELISA) techniques were used to test the collected samples for the presence of soybean mosaic virus and Yellow mosaic virus (YMV). Molecular technique, polymerase chain reaction (PCR) used for further confirmatory analysis of presence of these viruses respectively. The Coat protein (CP) gene is a good tool for examining the existence of virus in the infected fields by using specific primer. The amplified gene was sequenced and aligned with the others Begomovirus available in the GenBank. The amplified fragment of the CP gene was about 520bp in all samples. Out of both the virus the main concern of research is focused on Yellow mosaic virus (YMV) in some verities of soybean. Yellow mosaic virus CP gene shown maximum homology with NCBI database. Phylogenetic tree were also constructed using Mega 6.0 software program for evolutionary relationship.

OP 7: Role of in vitro NRU test for phototoxicity testing of personal care products (PCPs)

Sandeep Negi, Ajeet Kumar Srivastav & Lakshmi Bala, Department of Biochemistry, BBD University, Lucknow, Email: sandeepnegi07pauri@gmail.com.

The requirement of alternative methods to animal experimentation has increased highly these days. Regulators, including OECD, FDA and EPA, have recognized the acceptance of the alternative methods as valuable tools of modern toxicology. Alternative methods are able to REDUCE the number of animals necessary in a test, REFINE toxicology procedures to make them less painful or stressful to laboratory animals, or REPLACE animals with non-animal (in vitro, ex-vivo or in silico systems). The photo-toxicity testing of cosmetics on animals has banned for reduction and replacement of the use of laboratory animals in India and many other countries. Currently, the In vitro Neutral Red uptake Phototoxicity Test (NRU PT) has been approved as a non-animal phototoxicity test by governmental regulatory agencies in OECD countries. NRU PT (OECD guideline 432) was adopted for Phototoxicity assessment in 13th April 2004, as an alternative method, which is used to identify the phototoxic potential of a test substance induced by the excited chemical after exposure to light. Fundamental principle of this test is the comparison of cell viability in the presence or absence of UV/Visible irradiation as determined with vital dye, neutral red, which is a weak cationic dye that readily penetrates cell membranes and accumulating intracellular in lysosomes of viable cells. This cytotoxicity assay employs the cell line, based on the ability of viable cells to incorporate and bind the dye Neutral Red (NR). The uptake of NR is measured spectrophotometrically. Cytotoxicity in this test is expressed as a concentration-dependent reduction of the uptake of the vital dye neutral red when measured 24 h after treatment with the test chemical and irradiation. NR dye penetrates cell membranes by non-diffusion, accumulating intracellular in lysosomes. Alterations of the cell surface of the sensitive lysosomal membrane lead to lysosomal fragility and other changes that gradually become irreversible. Such changes brought about by the action of xenobiotics result in a decreased uptake and binding of NR. It is thus possible to distinguish between viable, damaged or dead cells, which are the basis of this test. Advantages of in vitro tests: controlled testing conditions, high level of standardization, reduction of variability between experiments, lack of systemic effects, testing is fast and in most instances inexpensive, small amount of test material is required, limited amount of toxic waste is produced, human cells and tissues can be used, transgenic cells carrying human genes can be used and reduction of testing in laboratory animals.

OP 8: Tumor necrosis factor-alpha (TNF-α) genetic polymorphisms impact falciparum malaria in India

Tabish Qidwai, Faculty of Biotechnology, Institute of Biosciences and Technology, Shri Ramswaroop Memorial University Lucknow, Deva Road, Barabanki, U.P. India, E-mail: tabish.iet@gmail.com, Phone no. +91-9140631326.

Plasmodium falciparum malaria is one of the major causes of mortality and morbidity throughout the world. Human host genetic factors have been shown to play role in susceptibility and severity of disease. Tumor necrosis factor (*TNF*) gene is located on chromosome-6 in the class III HLA region. The TNF protein is involved in multiple inflammatory and immune responses and plays an important role in the pathogenesis of many infectious diseases including *P. falciparum* malaria. Polymorphisms in regulatory region of *TNF-*α gene are associated with its expression. Single nucleotide polymorphisms (SNPs) rs1799964, rs1799724, rs1800750, rs1800629 and rs361525 in the proximal enhancer of the *TNF-*α gene have differential associations with malaria in different populations of the world. This prompted to explore the association of *TNF-*α enhancer polymorphisms with falciparum malaria in Indian population. *TNF-*α enhancer polymorphism were genotyped in malaria patients and ethnically matched controls in Indian population through direct sequencing. Association of the rs1799964 and rs1800630 SNPs with increased risk of severe malaria has been detected in the studied population. It may be suggested that *TNF-*α regulatory polymorphisms are potential contributor of disease severity.

OP 9: Incidence of diarrhea among children of Kasauli, Himachal Pradesh

Anita Kumari, Department of Agriculture & Veterinary Science, Jayoti Vidyapeeth Women's University, Jaipur, Email: rsm4176@gmail.com.

Diarrhea disease is one of the leading causes of illness in young children and infants in developing countries. A total of 400 children samples were collected under the age group of 5 years, who had diarrhea from three hospitals of Kasauli (Military Hospital, Primary Health Centre Kasauli Cantonment Hospital, ESIC Hospital, Kasauli). Out of which, 150 samples were from the 0—6 months infants (37.5%) followed by 7—12, 13—24, 25—36, 37-48and 49—60 months age group of children. In the present study, the higher prevalence of diarrhea was found in infants. The most prevalent bacterial species isolated from fecal specimens were *Escherichia coli* followed by *Salmonella, Shigella and Staphylococcus aureus*. In the present study, reported bottle feeding children are more prone to diarrheal bacterial infections may be due to bottle milk not be properly pasteurized and bottle milk can easily be contaminated during preparation with water and utensils. *E. coli* was the predominant species isolated from bottle feeders.

OP10: Cardioprotective, alpha glucosidase inhibition activity and antioxidant potential of boeravinone B, a rotenoid isolated from *Berhaavia diffusa* Lin

Salin Raj P[1,2], Sruthi Krishna K[1], and Raghu K G[1,2]*,

[1] Biochemistry and Molecular Mechanism Laboratory, Agro-Processing and Technology Division, CSIR — National Institute for Interdisciplinary Science and Technology (NIIST), Thiruvananthapuram, Kerala, India.

[2]Academy of Scientific and Innovative Research (AcSIR), Ghaziabad, Uttar Pradesh, India, Email: salinrajp@gmail.com.

New chemical entities of natural origin, especially from edible medicinal plants are nowadays getting much attention for the development of nutraceuticals for the treatment of metabolic disorders like diabetes, cardiovascular disorders, etc. because of their least side effects. The present study used the natural rotenoid compound boeravinone B (BB), isolated from the ethanolic extract of edible medicinal plant *Boerhaavia diffusa* and purity was determined using HPLC. The BB was analysed for its antioxidant, digestive enzyme inhibitory potential and cardio-protective activity. BB showed significant antioxidant activity against biological free radicals like hydroxyl and superoxide free radicals (84.46 ± 2.76μM and 40.23 ± 7.31 μM respectively). It also showed significant inhibition against α-glucosidase (37.46 ± 2.56 μM) comparing with acarbose (26.64 ± 2.84 μM) and moderate inhibition against α-amylase (616.79 ± 8.56 μM) enzymes involved in the postprandial hyperglycaemia. BB showed moderate antiglycation activity (8.51 ± 1.46 μM) compared to standard aminoguanidine (1.54 ± 0.67 μM). The cardio-protective activity was evaluated by LDL oxidation and ACE inhibitory potential, and it showed significant inhibition with IC50 values 68.70 ± 3.68 μM and 10.21 ± 1.25 μM respectively. Also, the cytotoxicity analysis showed BB is nontoxic. The overall results from the study revealed BB as a potent antioxidant molecule with beneficial property for control of glucose concentration via inhibition of alpha glucosidase and significant cardioprotective property. This report is the first of this kind on BB, and it can be developed as a nutraceutical or functional food after detailed in vivo analysis.

Session-III: plant biotechnology

OP1: *In vitro* mass propagation of *Rudraksha* and antibacterial activity assessment of in vitro raised plantlets

Manu Pant* & Ankita Lal**, *Department of Life Sciences, Graphic Era (Deemed to be University), 566/6 Bell Road, Clement Town, Dehradun, **Department of Biotechnology, Graphic Era (Deemed to be University), 566/6 Bell Road, Clement Town, Dehradun, **Email:* himaniab@gmail.com.

An efficient procedure for in vitro propagation of Elaeocarpus sphaericus (rudraksha) has been developed with subsequent assessment of antibacterial property of in vitro raised plantlets. Optimal axillary shoot multiplication was achieved on MS medium supplemented with cytokinin BAP. Effect of adjuvant was also assessed on in vitro shoot multiplication. Optimal in vitro rooting was obtained on half strength MS medium supplemented with auxin. Regenerated plantlets with well developed shoots and roots were hardened in vitro. The leaves of tissue culture raised plantlets were assessed for activity against bacterial pathogens. The protocol developed ensures large scale production of rudraksha tree and opens up scope of scientific interventions directed at its allied therapeutic usage.

OP 2: Formulation, development and comparative nutritional analysis of value added amla pickle fortified by using spirulina powder

Sonal Bhatt[1], Anuj Maheshwari[2] & Lakshmi Bala[3]*, [1]Departments of Biochemistry and Nutrition, [2]General Medicine, Babu Banarasi Das University, Faizabad Road, Lucknow 226028, India. *Email: balalakshmi@rediffmail.com.

Spirulina has been called a super food of its unique nutritional composition. It is one of the most nutritious concentrated whole foods known to human kind. It is an excellent source of good quality natural protein with all essential amino acids in perfect balance which is usually found in animal tissues. This study aimed at incorporating the spirulina powder for the formulation and the development of value added amla pickle and its organoleptic and comparative nutritional analysis. The spirulina powder was incorporated in amla pickle at 3 different percent levels as 3%, 5% and 7%. The most acceptable product was further nutritionally analyzed and compared to control sample. Using the nine point hedonic scale did the organoleptic analysis. The parameters for the nutritional analysis were protein, fat, moisture, fiber, carbohydrate, energy, ash, vitamin C, β carotene, calcium, iron and phosphorus. The result revealed that value added amla pickle at 5% was the most acceptable. In the fortified amla pickle it is found that moisture, ash, energy were decreased whereas protein, carbohydrate, fiber, β carotene, vitamin C, iron, calcium and phosphorus content were increased when compared to control sample.

OP 3: Biofuel profiling of micro-algae of polluted habitats of Meerut and adjoining areas

Jyoti Singh, Sunil Kumar, Neha, Nida Ziyaul and *Rama Kant, Department of Botany, Chaudhary Charan Singh University, Meerut, India 250004, * Email: ramakant.algae@gmail.com.

Microalgae have long been recognized as potentially sources for biofuel production because of their relatively high oil content and rapid biomass production. It also has unique importance to reduce gaseous emissions, greenhouse gases, climatic changes, global warming receding of glaciers, rising sea levels and loss of biodiversity. Microalgae can grow very fast as compared to terrestrial crops and plants. The practice of algal mass culture can be performed on non-arable lands using non-potable saline waste water. Oil content of microalgae is commonly between 20% and 50% while some strains can reach as high as 80%. This is why microalgae are focused for bio-fuel area. Algal biofuels may give a viable alternative to fossil fuels. The microalgae, like *Oscillatoria, Spirullina, Anabeana, Nostoc, Cylindospermum* and *Lyngbya* sp., have high oil content. Algae contain approximately 30% oil by weight which is huge compared to other bio-fuels. Biodiesel has gained much attention in recent years due to its eco-friendly nature, non-toxic characteristics, biodegradability and lower net carbon cycle compared to conventional diesel fuels. In the current study, potential algal species *Oscillatoria* and *Lyngbya* were collected from different sites of Meerut city and employed as a feedstock for biodiesel production.

OP-4: Comparative in silico identification and characterization of glutathione S-transferase gene family in two agriculturally important solanaceous crops

Swati Vaish[1], Divya Gupta[1] & Mahesh Kumar Basantani[1]*, [1]Faculty of Biosciences, Institute of Biosciences and Technology, Shri Ramswaroop Memorial University, Lucknow-Deva Road, Barabanki, UP, India 225003, * Email: mkbasantani@gmail.com.

Plant glutathione S-transferases (GSTs; EC 2.5.1.1.8) are multifunctional proteins, ubiquitously found in prokaryotes and eukaryotes. They play a major role in stress responses by preventing oxidative damage by reactive oxygen species (ROS). GSTs are majorly involved in plant endogenous metabolism, including biotic and abiotic stress tolerance, normal growth and development. With the molecular biology and bioinformatics approaches, GST gene family has been well characterized in diverse plant species. In the current study, genome-wide identification of GST gene family in agriculturally important solanaceous crops *Solanum melongena* (brinjal) and *Solanum tuberosum* (potato) were performed. Employing bioinformatics approaches, multiple full-length GST genes were identified in genomes of *S. melongena* and *S. tuberosum*, belonging to seven traditional classes Tau, Phi, Theta, Zeta, Lambda, DHAR, and EF1Bγ. A total of 51 and 77 GSTs were identified in *S. melongena* and *S. tuberosum*, respectively. In both the crops, the number of GSTs varied class wise. The domain organization of the GST proteins was confirmed by NCBI batch-CD search. These GSTs were further characterized biochemically for their molecular weight, pI and protein length. Their subcellular locations were also identified. The finding of GSTs in economically important crops can widen the opportunities for future work such as cloning and characterization of their functional role in plant growth and development, and stress physiology.

OP 5: Hypoglycemic and hyperlipidemic effect of oyster mushroom (*Pleurotus ostreatus*) extract in Indian obese children

Kulshrestha Himani[1], Gupta Vani[2]., Gupta Vandana[3], Mishra Supriya & Mishra Sameeksha[2,] [1]Department of Biotechnology, Maharishi University of Information Technology, Lucknow, [2]Department of Physiology, King George's Medical University, Lucknow. [3]Department of Obstetrics and Gynaecology, Raja Dashrath Medical College, Ayodhya, India, Email: himanikul01@gmail.com.

Objective: To study the hypoglycaemic and hyper lipidemic effect of edible oyster mushroom in obese children in India. We investigated the role of *P. ostreatus* in obese children. Methods: The study included 220 obese children and adolescents (body mass index [BMI] $\geq$84th percentile) of age group 5–17 years. The obesity was determined on the basis of BMI percentile according to the criteria adapted from the National Cholesterol Education Program Adult Treatment Panel III (NCEP ATP III) guidelines. Blood glucose level were studied after one month of treatment & followed up to three months. Finding: Obese children treated with Oyster Mushroom (*P. ostreatus*) showed a significant decrease in blood glucose level ($<$0.01). The post treatment with Oyster Mushroom extract significantly reduced serum cholesterol, triglyceride and LDL-cholesterol ($p < 0.01$). The serum HDL cholesterol was significantly increased in post treated obese children. Thus, strategies to reduce blood glucose level &increase HDL levels may reduce risk of development of metabolic risk factors in obese children. Conclusions: The consumption of Oyster mushroom extract produced a significant hypoglycaemic effect in obese children and it is capable of improving hyperlipidaemia. Thus, indicating that the extract of Oyster Mushroom could be added in the list of medicinal preparations beneficial in obese children.

OP 6: Identification and analysis of salinity responsive sodium transporter (HKT1) candidate gene in chickpea (*Cicer arietinum*)

Priyanka Gangwar & Mala Trivedi, Amity Institute of Biotechnology, Amity University Uttar Pradesh, Lucknow Campus, 226028, Email: gangwar.priyanka8@gmail.com.

India Chickpea is an essential food legume crop for semi-arid regions; however, salinity stress severely limits chickpea production in many parts of the world. Candidate genes associated with salinity stress response will help breeding efforts aiming to enhance its productivity and development of salt-tolerant varieties. Keeping this in mind the present study focuses on the identification of candidate genes responsive to salinity stress in chickpeas. Phylogeny-assisted alignments were used to design a set of PCR primers for the detection, recovery and sequence analysis of corresponding gene fragments from a variety of model plants and other crop species sources. This gene was subjected to designing sequence-specific primer using NCBI Primer-BLAST tool. A total of 10 primers pairs were designed and primer's amplification efficiency-related properties were analyzed through primer analysis tool. Based on the stability of secondary structures, melting temperature (Tm) and GC% among 10 primers, the maximum number of rating (94 and 90) was observed in HKTP-2 primer including 57.5/53.4 GC%, 57.11/55.55 Tm, −4.89/-5.36 self dimer and −9.64 cross dimer. After a comprehensive analysis of all ten primer sets, to determine the specificity of primers, four top-rated primers were selected for PCR validation in total DNA of 40 genotypes of chickpea accessions. Only HKTP-2 gave strong, sharp and reproducible amplicons with expected product size ~1050 bp in 36 chickpea accessions, thus confirm the presence of gene and significant specificity of the primers. This sodium transporter HKT1-like gene can be further explored for SNP genotyping and association analysis and the results would be used for developing superior chickpea varieties with improved yield under stress conditions.

OP 7: Replacement of stacked transgenes by bxb1 and cre recombinases

Gurminder Kaur, Faculty of Bio-Sciences, Institute of Bio-Sciences and Technology, Shri Ramswaroop Memorial University, Barabanki, India, Email: kgurminder13@yahoo.com.

Genetic improvement of agricultural crops via transgenesis requires the continuous introduction of new traits in crop plants in a clean and precise way. Gene stacking via site specific recombinases has emerged as a powerful tool to add new traits in plants without increasing the number of segregating loci that would impede the downstream introgression process. Stacking new DNA to a preexisting transgenic locus insures that the package of transgenes can be transmitted through breeding programs as a single locus rather than as numerous independently segregating loci. Previously, our lab described an in planta gene stacking method using the Bxb1 integrase for site-specific integration followed by the Cre recombinase for removal of unneeded DNA. This method permits the sequential addition of transgenes as each integrating molecule brings a new recombination target for the next round of integration. However, there could come a time when the previously engineered transgene needs to be deleted away or replaced by a new version or a different transgene. If that becomes necessary, there are two possible ways to edit or replace an existing transgenic locus. The first is based on using sequence specific nucleases such as Zn Finger nucleases, TALEN or CRISPR/Cas9 to cut at specific targets to induce host-mediated repair through non-homologous end joining or homologous recombination. However, as these sequence-specific nuclease tools have been patented, a commercial developer must first obtain licenses for their use. Alternatively, as we show here, it is possible to delete or replace preexisting transgenes by the same open-source Bxb1/Cre recombinase-mediated gene stacking system. This method illustrates the general utility of replacing previously stacked transgenes by new transgenes while maintaining the ability to continue to stack new traits thereafter with the described recombinase-mediated gene stacking system. More importantly, commercial crop improvement using this gene deletion/replacement strategy has freedom-to-operate, as opposed to the methods based on sequence specific nucleases.

Key Words: - Gene stacking, Gene replacement, Bxb1 integrase, Crerecombinase, Zn Finger nucleases, TALEN, CRISPR/Cas9, Non-homologous end joining, Homologous recombination.

OP 8: Development, analysis and sensory evaluation of mulberry fortified apricot food products

Sonal Prasad & Kritika Upadhyay, Faculty of Bio-Sciences, Institute of Bio-Sciences and Technology, Shri Ramswaroop Memorial University, Barabanki, India, Email: goaltara@yahoo.com.

The present study has been undertaken to innovate mulberry and apricot mixed food products that be relished by people of all age group. As such, value added products such as jam, squash and candies has been prepared by fortifying mulberry with apricot. These two fruits have rich antioxidant properties and contain large amount of Vitamin C, Vitamin A, Calcium and other essential nutrients. For this, three samples of Mulberries and apricot mixed fruit jam, squash and candies each were prepared using three different variations in the ratio of 3:1, 2:2, 1:3. Sensory evaluation of the three variations of jam, squash and candies has been done by a panel of 53 members (trained, semi-trained and untrained) using "Composite Scoring Test Card" to select the best one amongst the three samples in all three value added products. Statistically the Code-I was found to be highly acceptable than the other two samples in all three value added products. Physico-chemical and nutritional analysis of Energy, Vitamin C and Carotene of the highly acceptable squash was found to be 171 Kcal/100 g, 13.58 mg/100 gm and

20.80 ug/100 gm respectively. Nutritional analysis of Vitamin C and Carotene of the highly acceptable jam was found to be 13.28 mg/100 gm and 19.83 ug/100 gm respectively. Nutritional analysis of Energy, Vitamin C and Carotene of the highly acceptable candy was found to be 386 Kcal/100 g, 18.84 mg/100 gm and 10.22 ug/100 gm respectively. It would prove to be a wonder value added product to get available in all seasons throughout the year.

Session-IV: cancer biology

OP 1: Association of CyclinD1 gene polymorphism with the risk of oral malignancy in North Indian population

Somali Sanyal* & Kumud Nigam, Amity Institute of Biotechnology, Amity University Uttar Pradesh, Lucknow Campus, Lucknow-226028, India (AIB Communication No AIB/RA/2019/246 ...), Email: ssanyal@lko.amity.edu.

CyclinD1 gene is present on chromosome 11q13. It's a major regulator of the G1 phase of cell cycle progression. Variations of CCND1, leads to translocations and inversions, chromosome amplification, which are common in human cancers. Few reports have reported that CCND1 may be include in the development of some carcinomas in a CDK independent pattern. This study evaluated any association of CyclinD1 A/G (Msp1) polymorphism and risk for the development of oral malignancy in North Indian population. In the present study 370 subjects including 70 malignancy and 300 healthy controls been genotyped for CyclinD1 A/G (Msp1) polymorphism with PCR-RFLP method. Genotype and allele frequencies were analyzed by chi-square test and strength of associations by odds ratio with 95% confidence intervals. With reference to the AA genotype of CyclinD1 (A/G) polymorphism significantly increased risk of oral malignancy was observed with AG genotype (*p*-value = 0.026, OR = 1.87, 95% CI 1.10–3.16). However, such risk enhancement was not observed with GG genotype or G allele for the studied Cyclin D1 polymorphism. Our result from the present study suggest a possible association of CyclinD1 (A/G) polymorphism with the development of oral malignancy.

OP2: Polymorphism of Interleukin-6 -572G/C gene is associated with decreased susceptibility to oral cancer

Yadvendra Shahi & Sayali Mukherjee*, Amity Institute of Biotechnology, Amity University Uttar Pradesh, Lucknow Campus Lucknow-226028, India (AIB Communication No.-AIB/RA/2019/243), *Email: smukherjee@lko.amity.edu.

Purpose: Oral squamous cell carcinoma (OSCC) is one of the most common human malignancies; it is characterized by low survival rates, which makes this disease a serious public health problem. Oral carcinogenesis is a multistep process occurring due to environmental factors such as tobacco and alcohol abuse and gene alterations in oncogenes and tumor suppressor genes. Recently, polymorphisms in angiogenesis, inflammation and thrombosis related genes have been associated with an increased risk of oral cancer. One such factor, related to both thrombosis and malignancies, is Interleukin-6 (IL-6) which encodes a cytokine protein involved in inflammation, immune homeostasis and oral pathogenesis. The aim of this study was to evaluate the association between IL-6–572 G/C promoter gene polymorphisms and risk of OSCC among Indians. Methods: Single nucleotide polymorphism IL-6 gene was genotyped in OSCC patients ($n = 40$) and healthy controls ($n = 30$) by PCR-RFLP method. Genotype and allele frequencies were analyzed by chi-square test and strength of associations by odds ratio with 95% confidence intervals. Results: Frequency distribution of IL-6 (−572) G/C gene polymorphism was not significantly associated with OSCC patients in comparison to healthy controls (OR: 3.11, CI: 0.82–11.86; chi square = 2.92, $p = 0.087$). Conclusion: This study shows the genotype GC of IL-6 (−572) G/C gene polymorphism was not significantly associated in the development for the OSCC susceptibility.

OP3: A comparative evaluation of enzymatic antioxidant (superoxide dismutase) and TNF-α308 G/A polymorphism in oral precancerous lesions

Gyan Prakash Singh, Ojaswi Singh, Yadvendra Shahi & Sayali Mukherjee, Amity Institute of Biotechnology, Amity University, Uttar Pradesh, Lucknow Campus Lucknow-226028, India, Email: smukherjee@lko.amity.edu.

Precancerous lesions of oral mucosa, known as potentially malignant disorders in recent years, are consists of a group of diseases, which should be diagnosed in the early stage. Oral leukoplakia, oral submucous fibrosis, and oral erythroplakia are the most common oral mucosal diseases that have a very high malignant transformation rate. Although there are various etiological studies, the etiology well-known risk factors are consumption of tobacco, areca nut, and alcohol, which result in increased free radicals production. Reactive oxygen species (ROS) and free radicals are conjectured to be involved in neoplastic transformation. An imbalance between the production of ROS and the cell's oxidant capacity creates oxidative stress, which in turn may instigate or promote carcinogenesis in the cell by mutagenesis, cytotoxicity. Antioxidants are the first line of defense against free radical damage and are essential for maintaining optimum health and wellbeing. Superoxide dismutase (SOD) are the major enzymatic antioxidant defense system responsible for scavenging free radicals and nascent oxygen. Redox modulation is seen by distinctive changes in the activities of these enzyme systems in oxidative stress. Besides other factors, ROS production can also be triggered by the tumor necrosis factor (TNF) which may have an important role in the pre-oral cancer pathogenesis. To estimate and compare erythrocyte superoxide dismutase (SOD) levels and Single nucleotide polymorphism TNFα gene was genotyped by PCR-RFLP method in pre-oral cancer patients and healthy subjects. SOD levels in pre-oral cancer patients and healthy with many subjects in each group. SOD was estimated in erythrocytes spectrophotometrically by NBT reduction method at OD 560 nm. SOD was found to be 9.3 (unit/min/107 cells) in pre-oral cancer patients and 5.4987 (unit/min/107 cells) in healthy individuals. Decreased enzymatic antioxidant level in oral cancer patients indicate increased oxidative stress in these patients than healthy control. TNF-α −308 G/A polymorphism result revealed significantly increased frequency of heterozygous GA genotype in patients with oral precancerous lesions than wild type GG. We did not find mutant type AA genotype. Significant association was observed because of the substitution of G/A in the promotor region of TNFα-308 with oral pre-cancerous lesion.

OP 4: Observations on alteration in oral flora among oral cancer patients undergoing chemo-radiotherapy

Reeta Maurya[1], Manodeep Sen [1], Madhup Rastogi[2] & Somali Sanyal[2], [1]Department of Microbiology, Dr Ram Manohar Lohia Institute of Medical Sciences, Lucknow, [2]Department of Biotechnology, Amity Institute of Biotechnology, Amity University Uttar Pradesh, Lucknow, [3]Department of Radiation Oncology, Dr. Ram Manohar Lohia Institute of Medical Sciences, Lucknow, Email: reeta1707maurya@gmail.com.

Introduction: Cancer of the oral cavity and oropharynx cancer are two of the most common types of cancer of head and neck region. Mucositis is most common, debilitating complication of chemo-radiation therapy. Aim and Objectives: This study aimed to undertake pre RT, during RT and post RT comparative analysis of the oral microbial flora of patients with oral squamous cell carcinoma versus contralateral healthy mucosa controls and mucositis grade in oral cancerous patients. Materials and Methods: The study included cases 77 patients, and 28 contralateral side swab sample as a control group.% of males 89.5 ($n = 69$), and female % 10.3 ($n = 8$). Oral swabs and saliva were collected from all cases before, during (14—15th day of RT) and after radiation (end stage: 28—30th day of RT) and processed for aerobic bacterial culture as per standard protocol. Result: Treatment comprised 66.0 Gy of radiation therapy with or without chemotherapy. Bacteria identified were including *Staphylococcus aureus* (8.6%) in pre RT and 4.8% Post RT in patients. *E. coli* (6.5%) pre RT and 10.9% post RT. Yeasts (*Candida* spp) were found in 1.2% during RT and post RT same in swab and saliva culture. While contralateral side oral flora showed growth of CONS (36%), S. *a*ureus (4.5%) and *E. coli* (27%). 94% (73/77) of patients developed oral mucositis: 13.6% grade 1, 53% grade 2, and 31.5% grade 3. Conclusion: Bacterial colonization of the oropharynx prior to radiotherapy may be a factor for severe mucositis in oral cancer patients due to low immunity in cancer patients.

OP 5: Improving the quality of life of cancer patients suffering with thoracic radiation therapy induced esophagitis using promising therapeutic molecules from marine mangroves — an in vivo study

Vishnu Walsan & Guruvayoorappan. C*, Division of Cancer Research, Regional Cancer Centre, Thiruvananthapuram 695 011, Kerala, *E-mail: gururcctvm@gmail.com.

Radiation induced esophagitis is a major problem faced by cancer patients (especially lung cancer as well as head and neck cancer patients) receiving radiation therapy in the thoracic region. Radiation induced esophagitis is accompanied with odynophagia (irritation and burning sensation upon swallowing) and dysphagia (difficulties in the function of swallowing) there by affecting the quality of life of cancer patient as well as interrupting the radiotherapy treatment schedule due to pain and sufferings. Currently prescribed chemical radioprotectors have limitations and have side effects thereby its use are limited in medical practice. The objective of our study is to identify a result oriented safe and effective biological radioprotector from marine mangroves that could inhibit or alter the mechanism that result in esophageal damage during radiation therapy thereby mitigation esophagitis and its associated complications. We had selected the mangrove *Rhizophora apiculata* for the preliminary investigations and later isolated 1,2-Diazole (Pyrazole) from the mangrove. Our results in animal (C57BL/6 mice) models showed that treatment with *Rhizophora apiculata* or pyrazole significantly inhibited the radiation induced esophagitis compared with esophagitis control group. The histopathological analysis of the esophagus also supported the protective effect of the test material. Immunohistochemistry studies using antibodies (α-SMA, CD-45 and Ki-67) also showed promising results. Gene expression studies for (MIF, TNF-α, IL-1β, IL-5, IL-13, GM-CSF and IFN-γ) have also revealed that *Rhizophora apiculata* or pyrazole treatment could significantly regulate the expression of these genes. Similarly, lung cancer was induced in animal models and was subjected to radiation therapy accompanied with simultaneous treatment with *Rhizophora apiculata* or pyrazole treatment. The results showed that the treatment not only reduced esophagitis but also could significantly decrease the lung tumor nodule formation.

OP6: Analysis and homology modeling of potential target proteins of *Mycobacterium tuberculosis*: an in-silico approach

Devvret[1], Himani Joshi[1], Neema Tufuchi[1], Kumud Pant[1] & Ashish Thapliyal[2], [1] Department of Biotechnology, [2] Department of Life Sciences, Graphic Era Deemed to be University, Dehradun, Uttarakhand, India.

Background: Tuberculosis (TB) is a devastating disease caused by the bacterium *Mycobacterium tuberculosis*. It is one of the leading causes of death and around one third population is infected worldwide. In developing countries, the rates of tuberculosis are high among young adults. *Mycobacterium tuberculosis* is smart enough and can persist in the host tissue through years by escaping the host immune response. The progression of MTB infection to disease is triggered by its virulence and pathogenesis. Understanding the proteins and their role in biological system is essential to combat the disease. In the study bioinformatics approach was adopted to study the structure and properties of the proteins present in *Mycobacterium tubercul*osis. Methods: Proteins are the building blocks of cells in all living creatures. Proteins carry out various life processes like maintenance, replication, defence and reproduction. The proteins selected for the study were ArgA (Amino acid N-acetyltransferase and inactive acetyl glutamate kinase), MurG (N-acetylglucosaminyl transferase) IspF (Isoprenoid F) and ATPA (ATPase subunit alpha). Physico-chemical analysis was done to study the properties like Aliphatic Index, Isoelectric Point, Extinction Coefficient, Grand Average of Hydropathy (GRAVY) and Instability Index which provide data about these proteins. Functional characterization, prediction of motifs, patterns, disulphide bonds and secondary structures were performed. Results: The insight to the protein structures were studied through primary and secondary structure analysis and the tertiary structure of the studied proteins were developed that can further help the researchers to formulate new drugs against the disease.

OP7: Serodiagnosis of Leptospirosis in pediatric patients at a tertiary care center

Asmat Jahan*[1], Sanjeev Kumar Verma[2], Kamlesh Kumar Gupta[2], Raj Kumar Kalyan[2], Prachi Bhargava[1]. * Faculty of Biosciences, Institute of Biosciences & Technology, Shri Ramswaroop Memorial University, Barabanki (UP), King George's Medical University, Lucknow. Email id: prachi.bio@srmu.ac.in.

Background: Leptospirosis is a neglected zoonotic disease with global distribution that is caused by infection of spirochetes from the genus Leptospira. In 1931 Leptospira has been recognized in India. It is considered under diagnosed because of its nonspecific presentation and lack of proper understanding of its epidemiology, especially in children. Aim & Objectives: To detect IgM antibodies against Leptospira in pediatric patients at a tertiary care center. Methods: This study was carried out for a period of one year from January 2018 to December 2018 at department of microbiology (King George's Medical University Lucknow). A total of 50 pediatric patients aged <12 years with febrile illness were consecutively included in this study. Consent was taken from all patients and Patient data namely, demographic and clinical histories were obtained from patients before enrollment to this study. 5 ml each of whole blood samples collected in plain vial and serum was separated and aliquoted. 50 Serum were screened by following manufacture's instruction using Panbio Diagnostic kit. Ethical approval.

This study was approved by the institutional Ethics committee of the King George's Medical University, Lucknow (Approval no. 147/Ethics/R. Cell-18). Results: 50 children were suspected of leptospirosis with undifferentiated fever, out of 50, 6 (12%) were found to be positive for *Leptospira*. In this study 36 boys and 14 girls were enrolled and out of 6, 2 boys and out of 6, 4 girls were found to be positive for leptospirosis. There were 35 urban and 15 rural patients were suspected for *Leptospira*. Most patients of leptospirosis showed SIGN/symptoms of fever/jaundice/rashes/muscle pain. Conclusions: Serodiagnosis by IgM ELISA for leptospirosis can be easily diagnosed. Oral doxycycline is the choice for treatment of leptospirosis.

OP8: *In-silico* prediction of nootropic properties of novel drug modafiendz

Kumud Pant[1], Abhishek Semwal[1], Devvret Verma[1], Promila Sharma[2], Neema Tufchi[1], Akansha Pal[1], Abhilasha Mishra[3], 1 Department of Biotechnology,2 Department of Life Sciences, 3 Department of Chemistry, Graphic Era Deemed to be University Dehradun, India, Corresponding author: pant.kumud@gmail.com.

The demand for new drugs has exponentially increased in today's time, however the process of discovering/designing a drug to bring it to the market remains a tedious task. This has further boosted the use of in-silico techniques to analyze potential drug candidates. One important category of drugs is nootropes. Nootropics are memory enhancing drugs and their demand has skyrocketed in past few decades. Modafiendz is one such novel drug with structural similarity to modafinil (Nootropic drug). Due to its structural similarity to modafinil it may have similar properties and may act as a potential nootrope and is often used by the consumers as nootrope even though no major research has been carried out on this molecule, so remains an investigatory molecule. There are a number of software and online resources available that can be used to predict drug likeness and metabolic pathways of a molecule and hence can give us a good idea whether a certain molecule may have a pharmacological property or not and whether it can act as a potential drug molecule. Realizing the importance of modafiendz, in this paper various properties of modafiendz have been predicted like metabolism site, ADME properties, metabolite prediction and DNA adduct formation tendencies. Many of the in-silico analysis tools and resources are free to use and can be easily accessed throughout the globe, the presence of such software makes it easy to carry out research work and highly boosts research output and makes data and resources accessible to all.

OP9: Herbal medicines for treatment of diarrhea

Ram Naresh Sharma, Department of Agriculture & Veterinary Science, Jayoti Vidyapeeth Women's University, Jaipur, Email: rnupdh@gmail.com.

Diarrhea is the passage of three or more loose stools. It is characterized by increased gastrointestinal motility and secretion and a decrease in the absorption of fluid and electrolytes. Diarrhea is one of the leading causes of preventable death in developing countries and mainly affects children and infants. Herbal medicines have been used for treating diarrheal diseases, and it is estimated that up to 80% of the population in developing countries depend on traditional medicines for primary healthcare. There are an enormous number of herbal medicines around the world that are effective in treating diarrhea. Some of the medicinal plants such as *Amaranthus caudatus, Coffea arabica, Balanite srotundifolia, Boscia coriacea, Cissampelos pareira, Plumbago zeylanica, Solanum hastifolium, Berberis crataegina, Cornus mas, Ecballium elaterium, Mentha longifolia, Rhamnus cathartica,* and *Teucrium polium* are used in the treatment of diarrhea traditionally in different societies and communities. Medicinal plants are a promising source of new antidiarrheal drugs. For this reason, the WHO has encouraged studies pertaining to the treatment and prevention of diarrheal diseases using traditional medical practices. The extract of *various medicinal plants* contains phenols, tannins, flavonoids, saponins, terpenoids, glycosides, and anthraquinones by preliminary phytochemical screening tests, and most of these secondary metabolites were reported to have an antidiarrheal activity in many recent studies. Drug resistance is another challenge to think about antibiotics for used in the treatment of diarrhea. The high incidence of diarrhea in developing countries coupled with limitations of currently available antidiarrheal drugs and poor healthcare coverage may make traditional medicines and good alternative agents for the management of diarrhea.

OP10: *In vitro* evaluation of antioxidant potential and identification of *Lactobacillus gasseri* LGS22 strain using 16S rRNA sequencing isolated from mother milk

Sonakshi Rastogi 1, Vineeta Mittal 2 and Aditi Singh 1*, 1 Amity Institute of Biotechnology, Amity University Uttar Pradesh, Lucknow Campus, Gomti Nagar Extension, Lucknow. AIB, Communication No. AIB/RA/2019/257, Department of Microbiology, Dr Ram Manohar Lohia Institute of Medical Sciences, Lucknow. Email: asingh3@lko.amity.edu.

Oxidative stress is attributed due to imbalance between the production of reactive oxygen species (ROS) or free radicals and antioxidant defense system, which result in series of events such as, DNA hydroxylation, lipid peroxidation, protein denaturation and apoptosis, ultimately leading to decline in cell's viability. Recently, the quest for finding novel antioxidants with their purportive positive effects on human health is in interest. Probiotics have been known for several beneficial health effects when consumed in adequate amounts, one of them is their antioxidant activity both in vivo and in vitro. Among probiotic microorganisms, *Lactobacillus* species are prime members as they belong to "generally regarded as safe" status, thus in our study, several *Lactobacillus* species were isolated from its natural ecological niche, human breast milk and subsequently tested for their antioxidant activity. Both intact cells as well as culture supernatant of isolates were tested for antioxidant activity employing DPPH- free radical. Among all *Lactobacillus* isolates tested, LGS22 was found to possess highest antioxidant activity, with 74.450% scavenging by intact cells and 86.666% scavenging by culture supernatant. The result indicate that the scavenging percentage of supernatant is higher as compared to intact cells. This is probably due to secretion of metabolites in culture supernatant that aid in DPPH free radical-scavenging. Identification of isolate LGS22 was done using 16S ribosomal RNA (rRNA) sequence analysis, using universal primers 27 F and 1492R. Genomic DNA was extracted using DNA extraction kit (Himedia, India). Full length 1.5 Kb 16S rRNA gene was directly sequenced with primers 785 F and 907R using BigDye® Terminator v3.1 Cycle Sequencing Kit (Applied Biosystems). The sequence obtained was aligned and compared to known sequences in GenBank using online tool BLAST (http://blast.ncbi.nlm.nih.gov/Blast.cgi). Based on highest hit scores, the strain was identified as *Lactobacillus gasseri*. The nucleotide sequence of 16S rRNA was deposited at the GenBank database under the following accession number: *Lactobacillus gasseri* LGS22 (MN 258931). Also, identification by mass spectrometry MALDI-TOF, reveals genus and species of isolate LGS22 with high percentage of confidence (99%) as *Lactobacillus gasseri*. Thus, can be concluded that, *Lactobacillus gasseri* LGS22 is indigenous probiotic isolate that exhibited high antioxidative potential in vitro. For further elucidation of its efficacy, in vivo studies on animal models need to be carried out in order to develop better understanding of their therapeutic potential in treating chronic oxidative stress induced diseases.

OP11: Recognition of aberrant promoter methylation of P16 and MGMT genes in lung cancer patients

Supriya Karpathak1,2,3 Rajiv Garg 1, Sunil Kumar 2, Mohammad Kaleem Ahmad 3, 1 Department of Respiratory Medicine, King George Medical University, Lucknow, 2 Faculty of Bio-Sciences, Institute of Bio-Sciences and Technology, Shri Ramswaroop Memorial University, Barabanki (UP) India, 3 Department of Biochemistry, King George Medical University, Lucknow, Email: rajivkgmc@gmail.com.

Background: Lung cancer is the principal cause of death globally. Every year, lung cancer causes more than 1.6 million deaths; more than breast, colon and prostate cancers collectively. Aberrant methylation in gene promoter regions leads to transcriptional inactivation of cancer-related genes and plays an important role in carcinogenesis. Present study evaluates the methylation pattern in promoter region of the P16 and MGMT gene. Materials & methods: DNA was extracted from blood samples of lung cancer patients and healthy controls. A total 54 non—small cell lung cancer patients (smokers and ex-smokers) and 39 controls (non-smokers) were included. The frequency of promoter methylation in p16 and MGMT gene was determined by methylation-specific polymerase chain reactions (MSP). Result: The MSP of p16 gene indicated that the highest frequency was found in large cell carcinoma (4/7, 57.14%), followed by adenocarcinoma (21/40, 50%) and squamous cell carcinoma (2/7, 28%). On the other hand the methylation of the *MGMT* gene was less frequent in lung cancer as compared to p16 gene. Overall, promoter methylation was detected in 50% (27 of 54) and 33.3% (18 of 54) for the p16 and MGMT genes, respectively. Conclusion: The result showed that aberrant methylation of tumor suppressor genes may be a useful method for early diagnosis of lung cancer.

Session-V herbal medicine

OP 1: In vivo toxicological evolution of protein extracts from *Ulva lactuca* L. In marine seaweed using male wistar rats

Krishnamoorthi R[1]*, Sivakumar SR[1], Vigneshwaren M[1], Siva G[1], Rathinam A[2], Arjunan G[2], and Jayabalan N[1], [1]Department of Botany and [2] Animal Science, Bharathidasan University, Tiruchirappalli-24, Tamilnadu, India, *Email: krishnamoorthi143@gmail.com.

This study was aimed to assess the toxicological profile of *Ulva lactuca* L. through acute and sub-acute toxicity tests based on the OECD guideline 407. Toxicity assessment of protein extracted from *Ulva lactuca* L. seaweed was performed. An acute toxicity study was carried out using a single dose of 2000 mg/kg for 28 days and multi dose sub-acute toxicity study, was carried out by administering the doses of 250, 500 and 1000 mg/kg/day for 28 days. Rats were observed weekly for toxicity symptoms and compared with the control group, each group three rats for these studies. At the end of study, the animals were killed and their body weight, hematology, serum chemistry, and histopathology evaluation were done. Compared to the control group in acute and sub-acute toxicity studies similar changes in body weight gain, feed consumption, clinical pathology evaluation, and organ weight were observed. The LD50 did not produce any significant treatment related changes in clinical observations and hence, hematological, histopathological and serum biochemical parameters were within the normal limits. The toxicity study did not show any toxicological mortality and no behavioral changes were observed in rats treated with acute and sub-acute studies.

OP 2: Herbal drug formulation for dermatological disorders with special emphasis on Berberis aristata

Nimisha[1]*, Z Fatima[1], D A Rizvi[3] & CD Kaur[2], nsrivastava3@lko.amity.edu, Amity Institute of Pharmacy, Amity University, Lucknow, Uttar Pradesh, India. Sri Rawatpurwa Sarkar Institutes of Pharmacy, Durg, Chattisgarh, India, Era's Medical College, Department of Pharmacology, Lucknow.

Introduction: Herbal novel drug delivery system for dermatological disorders results in manifold increase in activity as compared with conventional formulations. The topical route is especially appropriate for skin diseases, although some dermatologic diseases respond well or better to drugs administered systemically or when drug reaches to systemic circulation through transdermal application. Method: Nanoethosomal gel of *Berberis aristata* (Daruharidra) extract was developed for dermatological disorders like psoriasis, skin irritation and inflammation. Carbopol 934P 0.5% gel was prepared. Imiquimod (immune modifier) was applied topically on the shaven back of mice for 11th days and on 12th day animal showed psoriasis like inflammation. Histopathological examination of inflamed tissue was also done to observe change in epidermal thickness and elongation of rete ridges. Result: Physicochemical properties of the gel like drug content, viscosity and spreadability were evaluated. Comparison with conventional formulation (AngleGloss, PhytoLab Pvt Ltd.) was done for their efficacy against inflammation, imiquimod-induced psoriasis and skin sensitivity. 58.16 percent inhibition of edema by ethosomal gel was observed as compared to 33.5 percent by conventional gel of extract as determined by Carrageenan-induced paw edema method. Primary irritation index was found to be < 0.4 inferring its safe use for topical formulation. Conclusion: The present research work focuses on use of herbal drugs in novel drug delivery system for dermatological disorders and it proves the potential of ethosomes for incorporating the extract and improving the effectiveness in the management of psoriasis and inflammation.

OP 3: Synthesis, computational analysis and antimicrobial assay of novel series of 5-amino-1H-pyrazole-4-carbonitrile derivatives

Nidhi Singh & Jaya Pandey, Amity School of Applied Sciences, AUUP, Lucknow Campus-226028. Email: nsingh9@lko.amity.edu.

Pyrazoles are pharmacologically active scaffolds which encompasses its usage in diverse therapeutic activities. Besides this, the heterocyclic moieties of pyrrolidine, piperidine and morpholine also exhibit multiple therapeutic properties. Thereby, keeping these cardinal points in view, a series of novel 5-Amino-1H-Pyrazole-4-Carbonitrile derivatives was synthesized, by integrating the two therapeutically advanced scaffolds for developing a lead compound with a superior potential. The purpose of coalition of the two pharmacologically important cores: pyrazole and heterocyclic moieties viz. pyrrolidine, piperidine and morpholine, was to develop a prospective lead compound with better therapeutic potential and medicinal value. The synthesized compounds were spectrally analyzed for their characterization. Furthermore, these compounds were scrutinized for their pharmacokinetic factors through computational analysis, thereby exploring the probability percentage of them, being drug molecules. They were also screened for their bioactivity scores and drug-likeness scores and high probability percentages for the same were found. Keeping in view, the practical substantiation of the computational analysis, the synthesized compounds were also scanned for their antibacterial and antifungal potency, thereby validating the biological potency of the synthesized compounds.

OP 4: An innovative polyherbal oral formulation for diabetic population - preclinical toxicity and efficacy studies

Pranay Wal[1, 2] & Ankita Wal[1,2], [1]Department of Pharmacy, PSIT, Kanpur. [2]Diabport Healthcare Pvt. Ltd., Kanpur, Email: vishwas101@yahoo.com.

Diabetes is a growing challenge in India, with an estimated 8.7% diabetic population in the age group of 20 and 70 years. Diabetes is a chronic disease, which occurs when the pancreas does not produce enough insulin, or when the body cannot effectively use the insulin it produces. Diabetes causes an increased concentration of glucose in the blood (hyperglycemia) and is also associated with high cholesterol (hyperlipidemia). We are reporting a formulation of an oral polyherbal mix for treatment of hyperglycemia and hyperlipidemia. The safety profile and efficacy study of polyherbal mixture (named Diabport-C) will be presented. A dose-escalation toxicity study was conducted in Wistar Albino rats. No toxic effects were observed until 2000 mg/kg levels, a repeated dose of 1000 mg/kg for 28 days was also found to be safe. The subacute study did not show any death or treatment-related adverse clinical signs in the animals. The treated animals showed healthy feed intake and comparable body weight gain. No abnormalities were seen in general parameters of animal wellness like discoloration, fur loss, nasal and oral mucous membrane for any ulceration, respiratory rate, heart rate, salivation, lacrimation, lethargy, piloerection, urinary incontinence, defecation, sleep, gait, tremors and convulsions. Further, Diabport-C administration in Wistar rats did not induce any major changes in urinalysis, hematological, and biochemical parameters. The histopathological findings did not show any significant transitions relevant to Diabport C administration. We will present the successful development of a polyherbal formulation for utility in diabetic and prediabetic population.

OP 5: Inhibitory effect of probiotic bacterial biofilms on the *Pseudomonas aeruginosa* biofilm

Ankita Srivastava*, & Sunil Kumar, Faculty of Bio-Sciences, Institute of Bio-Sciences and Technology, Shri Ramswaroop Memorial University, Barabanki-225003, Uttar Pradesh, India, *Email: srivastavaankita238@gmail.com.

Background: Bacterial biofilms are self-regulating and aggregated form of bacteria which forms communities of single as well as multi species. These multi species cooperate with environment to carryout different processes. Biofilms are formed by probiotic as well as the pathogenic bacteria which are beneficial for the development of microbial population. Pathogenic bacterial biofilm has been associated with drug resistant. It has been shown that the probiotic bacterial biofilm may inhibit the growth of pathogenic bacterial biofilm. Aim: To study the effect of probiotic bacterial biofilms on the biofilm formation by the *Pseudomonas aeruginosa*. Method: A total of four strains of *Lactobacillus* (*Lactobacillus amylovorus* MTCC No. 8129, *Lactobacillus acidophilus* MTCC No. 10307, *Lactobacillus fermentum* MTCC No. 903 and *Lactobacillus rhamnosus* MTCC No. 1423) alongwith pathogenic bacteria (*Pseudomonas aeruginosa*) were obtained from MTCC. The *Lactobacillus* strains were cultured in MRS medium. The biofilm formation was studied using test tube method and anti-biofilm was done on agar well plate. Result: The four strains of *Lactobacillus* formed biofilm (*Lactobacillus amylovorus* form weak, *Lactobacillus acidophilus*, *Lactobacillus fermentum* and *Lactobacillus rhamnosus* form no biofilm respectively). However the biofilm formation by *Pseudomonas aeruginosa* was strong. The mixed biofilm formation by *Lactobacillus amylovorus* and *Pseudomonas aeruginosa* form moderate, *Lactobacillus acidophilus* and *Pseudomonas aeruginosa* form no biofilm, *Lactobacillus fermentum* and *Pseudomonas aeruginosa* form no biofilm, *Lactobacillus rhamnosus* and *Pseudomonas aeruginosa* form no biofilm. Conclusion: The current study showed that probiotic bacteria biofilm inhibits the biofilm formation of the *Pseudomonas aeruginosa*.

OP 6: First report of *Allexivirus* in garlic from Afghanistan

Vineeta Yadav[1], Majid Yazdani[3] and Shahana Majumder[2], [1]Department of Biotechnology, Professor[1,2], Department of Life Sciences, Sharda University, Greater Noida, Email: vineeta.yadav@sharda.ac.in.

Garlic (*Allium sativum* L.) is an oldest known horticultural crop belongs to genus *Allium* and widely used as spice and condiment but yield of this crop can reduce by the infection of viruses belonging to the genera Potyvirus, Carla virus and *Allexivirus*. In this study we have standardized the RT- PCR and detect the presence of *Allexivirus* in Afghanistan Garlic and study the phylogenetic analysis. Garlic bulbs were collected from chaman_e hozoree, Kabul, Afghanistan and were tested for the presence of *Allexiviruses* by using reverse transcription (RT)-PCR. Total RNA was extracted from garlic clove by using an RNeasy Plant Mini kit (Qiagen) according to the manufacturer's protocol and RT-PCR was performed using primers designed by using conserved regions of *Allexivirus* sequences. Direct sequencing of the PCR product was done and 638 bp long amplicon was obtained after sequencing. BLAST analysis of the sequence revealed 85% nucleotide (MF795136, MF363012) sequence identity with a other garlic virus D (GVD) isolates from China. To our knowledge, this is the first report of garlic virus D in garlic from Afghanistan.

OP7: Escalating role of green chemistry in extraction procedure

Shom Prakash Kushwaha*1, 3, Sujeet Kumar Gupta 2, Sushil Kumar 3, 1 Faculty of Pharmacy, Integral University, Lucknow, 2 Hygia Institute of Pharmaceutical Education and Research, Lucknow, 3 Faculty of Pharmacy, IFTM University, Moradabad. Email: somspk2@gmail.com.

Desire of inventing natural pharmaceutical moieties is conventionally implemented through extraction procedures. Organic solvents such as acetone damages the environment and possess both short term and long term health dangers to living beings. Thus chemical intended as auxiliary in drug discovery process for curing a disease, acutely becomes a potent candidate for causing a disease. A smart way to prevent chemical pollution is green chemistry. Green chemistry is a view point of science that boosts the research design that reduces the use and generation of toxic entities. Extraction involving organic solvents such as alcohol, chloroform lead to awkward waste material. Aqueous extraction is a better extraction medium as water purification cost is low and can be reused easily. Thus the overall production cost can be decreased and affordability of product is increased. Demand of water soluble entities such as sweeteners and antioxidants have increased dramatically. Traces of water present in product will not result in toxicity as that compared to organic solvents traces. High dielectric constant and high boiling point allow the convenient manipulation of conditions for extraction of polar constituents such as polyphenols. Chemical accidents such as fire and toxic solvent fumes at room temperature are also composed. Eventually aqueous extraction underpins various aspect of a sustainable green livelihoods.

OP8: Curcumin application to improve edible fish quality of natural resources

Abha Mishra 1, Jyoti Pandey 2 and Pooja Pandey 1, 1 Department of Zoology, School of Life Sciences, 2 Department of Chemistry, Babasaheb Bhimrao Ambedkar University (A Central University), Lucknow-226025, Email: drabhamishra@gmail.com.

Development of human civilization and greedy exploitation of nature leads to deteriorating environmental condition, both aerial and aquatic. Untreated direct discharge of the rural and urban waste to rivers has disturbed and malign aquatic biota. Fish are the main victim of the polluted water body. Majority of the water bodies have traced to a significant level (against WHO standard) of heavy metal, harmful chemicals and endocrine disruptors. It reflects in poor body mass index and immunity. The edible fish *Heteropneustes fossilis* is a well known freshwater catfish for its sturdy makeup. The wild catch of *H. fossilis* represents deterioration in external and internal features. It reflects with meager nutritional composition of the body. That means poor in food quality for human consumption. When these wild catch fish kept with curcumin (bioactive chemical of turmeric) treatment for 1, 5 and 21 days fish registered significant improvement in its blood parameters as well as key bio-molecules (total protein, carbohydrate and lipid composition). The same fish, when extended for one week without curcumin treatment, was not able to maintain health indices. The results suggested that curcumin effect is overall health-supportive, but the impact is only local and temporary, not long-lasting. In conclusion, before consuming any live fish, it is recommended to maintain in curcumin water for at least 24 h to increase its health quality or body cleaning.

Session-VI: neurosciences

OP 1: Impaired neuronal autophagy flux and microglia activation is associated with decrease in hippocampus neurogenesis and neurobehavioral deficits following Japanese encephalitis virus infection

Alok Kumar, Department of Molecular Medicine and Biotechnology, Sanjay Gandhi Post Graduate Institute of Medical Sciences, Raebareily Road, Lucknow, 226014, Uttar Pradesh, India. Email: aloksgpgi@gmail.com.

Host autophagy regulation plays key role in determining neuroinflammation and neuronal survivability in neuroviral infection diseases of Japanese encephalitis (JE) viral infection. Here, by using in vivo mouse model of JE viral infection, we demonstrated that host autophagy regulation got impaired after JE viral infection and associated with deleterious immune responses, neuronal cell death and neurobehavioral dysfunction in infected mouse brain in compare to control animals. We noted that autophagy substrate SQSTM1/p62 (sequestosome 1) accumulates in cortical tissue along with change in microglia cell morphology to reactive (hypertrophy and bushy) phenotype with higher expression of proinflammatory mRNA level of IL1β, TNF-α, IFNγ and IL6. In addition, persistent reactive microglia activation phenotype was further observed in hippocampus through 7 days after JE viral infection and was found to be associated with increased endoplasmic reticulum stress (caspase-12), neurodegeneration (ubiquitin) and decreased hippocampal neurogenesis (double cortin; dcx). We further found that JE viral infection, regulated autophagy pathways by controlling Akt and AMPK phosphorylation (p) as indicated by increased Akt (p) expression and decreased AMPK (p) expression in cortical tissue at day 7, compared to control. The above findings were further confirmed in vitro cell culture model of neuronal (N2a) and microglia (Bv2) cells. Taken together these results revealed for the first time that autophagic clearance is impaired in host neuronal cell after JE viral infection, at least partially by promoting Akt (p) activation and decreasing APMK (p) signaling pathways, might contribute to progressive neurodegeneration/neuroinflammation, decrease in hippocampus neurogenesis.

Keywords: Neurogenesis, inflammation, autophagy, infection and ubiquitin.

OP2: *In-silico* prediction of nootropic properties of novel drug modafiendz

Kumud Pant [1], Abhishek Semwal[1], Devvret Verma [1], Promila Sharma [2], Neema Tufchi[1], Akansha Pal [1], Abhilasha Mishra [3], 1 Department of Biotechnology,2 Department of Life Sciences, 3 Department of Chemistry, Graphic Era Deemed to be University Dehradun, India, Corresponding author: pant.kumud@gmail.com.

The demand for new drugs has exponentially increased in today's time, however the process of discovering/designing a drug to bring it to the market remains a tedious task. This has further boosted the use of in-silico techniques to analyze potential drug candidates. One important category of drugs is nootropes. Nootropics are memory enhancing drugs and their demand has skyrocketed in past few decades. Modafiendz is one such novel drug with structural similarity to modafinil (Nootropic drug). Due to its structural similarity to modafinil it may have similar properties and may act as a potential nootrope and is often used by the consumers as nootrope even though no major research has been carried out on this molecule, so remains an investigatory molecule. There are a number of software and online resources available that can be used to predict drug likeness and metabolic pathways of a molecule and hence can give us a good idea whether a certain molecule may have a pharmacological property or not and whether it can act as a potential drug molecule. Realizing the importance of modafiendz, in this paper various properties of modafiendz have been predicted like metabolism site, ADME properties, metabolite prediction and DNA adduct formation tendencies. Many of the in-silico analysis tools and resources are free to use and can be easily accessed throughout the globe, the presence of such software makes it easy to carry out research work and highly boosts research output and makes data and resources accessible to all.

OP 3: Carbon level proteome profiling of various model organisms — algorithm development and statistical analysis

Parul Johri* and Mala Trivedi, Amity Institute of Biotechnology, Amity University Uttar Pradesh, Lucknow Campus, UP India, *E mail: pjohri@lko.amity.edu.

The sequence alignment of proteins is an approach which relies on measuring the changes in protein sequences in terms of the differences in the alignment of amino acids in the sequences. It is a technique in bioinformatics which is used for the alignment of protein sequences to identify the regions of similarity whose presence is attributed to the existence of structural, functional and evolutionary relationships between the sequences. The key elements in all amino acids are hydrogen, carbon, oxygen, nitrogen and sulphur. These elements are responsible for giving the amino acids the properties of hydrophobicity/hydrophilicity, which play an important role in protein interactions. Almost all of the Bioinformatics tools made for protein sequence analysis compare amino acid of one sequence with another amino acid of the second sequence. In the present work, the protein sequence analysis is done at one step down that is analyzing the sequences at their atomic level. The study aimed to investigate the atom level protein sequence analysis. Carbon atom was focused in the study. The carbon distribution plot was compared with the hydropathy plot of various proteins, which resulted in an exact overlap ensuing that the property of being hydrophobic or hydrophilic is governed by this atom only. The basic intend of the study was to correlate the carbon distribution along a protein sequence to its hydropathy index value. In view of the limited availability of comparing sequences at their atomic level, a dynamic programming algorithm was developed to split the protein sequences into their respective atoms and calculate the carbon atom percentage by sliding a window. The graph was plotted on the carbon atom percentage and its frequency. Various statistical parameters were calculate like the mean frequency, the skewness of the curve, maximum and minimum values and were analyzed. Finally a distance matrix was made using the mean frequency and the skewness of the curve and clustering was done on that basis. The cluster analysis yielded those proteins tends to cluster on their carbon atom percentage.

OP 4: An insight into anti-arthritic property of *Schleichera oleosafor* rheumatoid arthritis using molecular modelling approach

Shivani Singh*, Shweta Paliwal, Namrata Verma, Surojeet Das, Niharika Chandra, Sachidanand Singh, Faculty of Biotechnology, Institute of Biosciences and Technology, Shri Ramswaroop Memorial University, Barabanki, INDIA, 225003, Email: shivanisingh.149@gmail.com.

Obtaining biologically active molecules which are having enhanced activity and reduced toxicity are the premier lead in the medicinal chemistry. Researchers are focusing on medicinal plants to obtain different combination of biological molecules for different diseases from so many years. Inflammatory diseases have become an important challenge for the medical world. There are number of synthetic drugs being used as standard treatment for different inflammatory diseases but they all are found to have different side effects. It has been reported that many medicinal plants like *Nyctanthes arbortristis*, *Lippia nodiflora*, *schleichera oleosa*, *Aloe barbadensis*, *Clerodendrum indicum*, *Actaea racemosa* etc have shown effective results against auto-inflammatory diseases. Auto-inflammatory diseases such as Rheumatoid Arthritis (RA) which is a disorders resulting from the immune system attacking body's own tissues leading in increased inflammation. According to recently published articles herbal plants like *schleichera oleosa* showed anti-inflammatory and anti-rheumatoid properties. Present work focuses on molecular modeling approach for the identification of biologically active molecules obtained from *schleichera oleosa*. Potential targets like Signal Transducers and Activators of Transcription (STAT1) and Tissue Inhibitor of Metalloprotenase (TIMP2) were obtained by network biology approache which were used for the docking analysis. Components like 19 and 18 of plant *schleichera oleosa* showed lowest glide energy ranging from −8 to −11 KJ/Mol on docking with TIMP2 and -5 to −9 KJ/Mol with STAT1 respectively. These components were also under the ADME toxicity level. This approach gave an insight to develop these biologically active molecules in lab with their synergetic effect for further animal model studies.

OP5: *In-silico* study on plant alkaloids derivatives as inhibitors for the treatment of Alzheimer's disease

Noopur Khare[1,*], Abhimanyu Jha[2] & Sanjiv Kumar Maheshwari[3], [1]PhD, Dr. A.P.J Abdul Kalam Technical University, Lucknow (U.P.), [2] Institute of Applied Medicines and Research, Ghaziabad (U.P.) and Institute of Technology and Management, Meerut (U.P.), *[1,3] Faculty of Biotechnology Shri Ramswaroop Memorial University, Barabanki (U.P.)

Alzheimer's disease (AD) is known as dementia which affects the nervous system resulting in the loss of memory. This disease is one the most frequently growing disease in the world. AD is basically caused by the accumulation of plaques through Beta-amyloid and tangles through tau protein, which blocks the ends of the nerve cell to pass the message from one nerve cell to another, which results in the depletion of neurons. The depletion of neurons is seen with progressive to the age. The 3D structure of the AChE, BChE was retrieved from the RCSB PDB database. A total of 90 derivatives were generated through ChemSketch software and 6 active flavonoids were retrieved from PubChem. These all files were converted into. pdb format. Initial docking was performed using iGEMDOCK v2.0 software. All the ligands were then passed for the drug likeliness property using Swiss ADME tool. The compounds which were found to be fit for the target were screened and were finally docked using AUTODOCK VINA software. In this study Dihyroquercetin was found to be effective lead molecule for the treatment of the Alzheimer's disease. This lead molecule can act as a good inhibitor for the plaques and tangles and can control the Alzheimer's disease.

OP6: Drug repurposing approach to identify novel inhibitors for targeting DNA gyrase in *Mycobacterium tuberculosis*: insights from biophysical and biochemical studies

Balasubramani G L[1*], Rinky Rajput[1], Manish Gupta[2], Rakesh Bhatnagar[2] & Abhinav Grover.[1]

[1]BioTherapeutics and Molecular modelling Lab and [2]Molecular Biology and Genetic Engineering Laboratory, School of Biotechnology, Jawaharlal Nehru University, New Delhi, India - 110067. *Email: glbala87@gmail.com.

Drug repurposing has gained momentum globally and become an alternative avenue for identifying new drugs against tuberculosis (TB). TB can be cured with the use of currently available anti-tubercular drugs, emergence of drug resistant strains of *Mycobacterium tuberculosis* H37Rv (*Mtb*) and the huge death toll globally, together necessitate urgently newer and effective drugs for TB. To address this problem, we have employed drug repurposing approach to screen FDA-approved drugs by virtual screening and binding free energy calculations to identify novel inhibitors against *Mtb* target enzyme, DNA gyrase. Screening of compounds was done against the active site of *Mtb* DNA gyrase, the region of ATP binding (N-terminal domain) pocket on gyrase B subunit. Here, we identified total of four compounds (Drug 97, Drug 45, Drug 77, Drug 38) tightly binds to ATPase binding pocket of gyrase B (*Mtb*GyrB). These compounds were simulated using GROMACS; the results generated were subjected to molecular mechanics-Poisson Boltzmann surface area (MM-PBSA) calculation. Docked results shows binding energy for drugs (Drug97, Drug45, Drug77, Drug38) as −9.94, −9.93, −9.69 and −8.87 kcal/mol. MM-PBSA predicted the binding free energy of the drug 97, drug 45, drug 77 and drug 38 to be −1123.18, −1025.211, −1016.250 and −339.745 kcal/mol, respectively. These four compounds showed equilibrium dissociation constant, *kD* values of 2.1–53.0 μM. Among them, drug97 shows *kD* values of 2.1 ± 0.17 μM. Our results suggest that the screened compound binds to the ATPase domain of gyrase B subunit and inhibits gyrase catalytic cycle. This finding indicates all the identified compounds represent potential scaffolds for further optimization of novel antibacterial agents that can act on drug-resistant strains.

OP7: Molecular interaction studies of Spicoside A against AP-4 complex subunit as target against non progressive neuromotor disorder

Apoorva Mishra, Ruchi Yadav, Prachi Srivastava*

AMITY Institute of Biotechnology, AMITY University, Uttar Pradesh, Lucknow Email: psrivastava@amity.edu.

Non-progressive neuromotor disorders are the disorders that affect the motor functions of the body. One of the common non progressive neuromotor disorders is cerebral palsy. This disorder usually develops in infants and children thus it can be classified as a paediatric disease. It affects a person's movement, balance and posture. Major studies reveal that proteins serve as an important factor in development of such neuromotor diseases. In the current course of work, through target identification, it was found out that the AP-4 complex subunit sigma is one of the many proteins that are associated with cerebral palsy. The AP-4 complex mediated trafficking play a vital role in the process of brain development and its functioning. The functioning of a protein is only viable in its 3-D structure. Thus, to study its functions, modelling of this protein was done using the Schrodinger software. As an inhibitive measure against this protein, twenty phytochemicals were screened out on the basis of Molinspiration software which is based upon the Lipinski's Rule of Five. Interactions of these phytochemicals were studied with the given protein using the standard docking protocol through the Schrodinger software through Glide dock. The molecular interaction studies revealed that Spicoside A shows maximum affinity against AP-4 complex subunit sigma protein. Thus, the respective phytochemical can be used as a herbal source that can perform inhibitive affect on the given protein.

List of poster presentations

PP 1: studies on fungal pectin lyases from *Fusarium* genera

Sangeeta Yadav* & Dinesh Yadav, Gene Cloning and Expression Lab, Department of Biotechnology, D.D.U. Gorakhpur University, Gorakhpur (U.P.) 273 009, INDIA, *E-mail: sangeeta_rahul@rediffmail.com.

PP 2: performance and emission characteristics of CI engine fuelled with blend of palm biodiesel and ZnO nano particles As a fuel Additives

Rohit Singh[1], & T.P.Singh[2]

Department of Chemical Engineering, Bundelkhand Institute of Engineering & Technology Jhansi-284128 (U.P.) INDIA, Email: rsrana894@gmail.com.

PP 3: status, challenges and management of solid waste: A global perspective

Alok Ranjan Singh, Amit Kumar Gautam, Anjali Prakash, Ankit Kumar, Aryan Khattri, Ayushi Srivastava, Eram Tariq*, Maryam Ahmed, Pratibha Yadav, Shashi Yadav, Swatantra Pratap Singh, Upasana Rawat & Surojeet Das, Faculty of Biotechnology, of Bioscience and Technology, Shri Ramswaroop Memorial University, Barabanki, Uttar Pradesh-225003, India, Email: surojeetdas1990@gmail.com.

PP 4: isolation and screening of antibiotic producing bacteria from soils: A study from northern India

Amit Pandey*, Ankita Srivastava, & Sunil Kumar, Faculty of Bio-Sciences, Institute of Bio-Sciences and Technology, Shri Ramswaroop Memorial University, Barabanki (UP), India, *Correspondence: amitbio1984@gmail.com.

PP 5: role of phosphate utilizing bacteria as biofertilizer

Kamala Nidhi Rai* & Sanjiv Kumar Maheshwari, Faculty of Bio-Sciences, Institute of Bio-Sciences and Technology, Shri Ramswaroop Memorial University, Barabanki (UP), India, Email: kamalanidhir@gmail.com.

PP 6: assessment of water quality from different region of Gomti river for fish growth and development: A review

Anjali Singh* & P.K. Srivastava, Institute of Bio- Sciences and Technology, Shri Ramswaroop Memorial University, Barabanki, UP-225003, India, Email: avikathakur1996@gmail.com.

PP 7: phytoremediation: environmentally sustainable way for reclamation of heavy metal polluted soils

Sabhyata Chaubey & Sunil Kumar, Faculty of Bio-Sciences, Institute of Bio-Sciences and Technology, Shri Ramswaroop Memorial University, Barabanki (India), Email: sabhyatachaubey3866@gmail.com.

PP 8: structural and functional enrichment of RGS4 protein associated with cortical dysplasia

Ruchi Yadav, Amity Institute of Biotechnology, Amity University Uttar Pradesh, Lucknow Campus, Lucknow U.P., India, Email: ryadav@lko.amity.edu.

PP 9: functional proteomic analysis of Cornelia De Lange syndrome

Pallavi Chattopadhyay* & Ruchi Yadav, Amity Institute of Biotechnology, Amity University Uttar Pradesh, Lucknow Campus,Lucknow-226028, India, Email: ryadav@lko.amity.edu.

PP 10: determination of the effects of oxidative stress markers and TNF-238 G/A polymorphism in patients with oral precancerous lesions

Sherry Yadav, Zainab Aftab, and Sayali Mukherjee*, Amity Institute of Biotechnology, Amity University Uttar Pradesh, Lucknow Campus, Gomti Nagar Extension, Lucknow. AIB, Communication No. AIB/RA/254, *Email: smukherjee@lko.amity.edu.

PP 11: analysing drug target interaction for Parkinsons disease using computational methods

Namrata Verma*, Shivani Singh, Shweta Paliwal, Surojeet Das, Niharika Chandra, and Sachidanand Singh, Faculty of Biotechnology, Institute of Biosciences and Technology, Shri Ramswaroop Memorial University, Barabanki, INDIA, 225003, Email: namrataverma269@gmail.com.

PP 12: computational approach for identification of osteopontin as intrinsically disordered proteins

Shweta Paliwal*, Surojeet Das, Shivani Singh, Namrata-Verma, Niharika Chandra, and Sachidanand Singh, Faculty of Biotechnology, Institute of Biosciences and Technology, Shri Ramswaroop Memorial University, Barabanki, INDIA, 225003, Email: paliwalshweta9876@gmail.com.

PP 13: clinical pattern and antifungal susceptibility of Cryptococcal meningitis from patients in northern India

Pushpa Yadav[1,2], Manodeep Sen[1]*, Anupam Das[1], J.K. Srivastava[2], A.K.Singh[3], P.K. Maurya[3], Poonam Chaturvedi[3], H.S. Malhotra[4], Gaurav Raj Agarwal[5], Tanushri Chaterjee[6]*, Department of [1]Microbiology, [3]Neurology and [5]Radio diagnosis, Dr. Ram Manohar Lohia Institute of Medical Sciences, Lucknow, [2]Amity Institute of Biotechnology, Amity University, Lucknow, [4]Department of Neurology, King George Medical University, Lucknow, [6]Department of Microbiology, Babu Banarasi Das University, Lucknow. Email: gudia65@gmail.com.

PP 14: *Microbacterium barkeri* SELA 4, a novel agarase producing bacterium isolated from soil enriched with laboratory agar

Shomini Parashar & Narendra Kumar, Department of Biotechnology, IMS Engineering College, Ghaziabad, Email: shomini.parashar@imsec.ac.in.

PP15: Aminoethylchitin nano carriers: synthesis, characterization and evaluation for drug delivery application

Shivangi Dingar, Ankush Kumar, Jyoti Rawat & Tanvi Jain, Shri Ramswaroop Memorial University, Lucknow-Deva Road -225003, India, Email: tanvijain87@gmail.com.

PP 16: diagnostic biomarkers in inflammatory Bowel diseases: A narrative review

Mahima Mishra[1], and Sunil Kumar[2]*, [1]Faculty of Biotechnology, [2]Faculty of Bio-Sciences, Institute of Bio-Sciences and Technology, Shri Ramswaroop Memorial University, Barabanki (India), Email: mahima3012mishra@gmail.com.

PP17: household salt iodine estimates and its effect on urinary iodine status of women of reproductive age (WRA) in double fortified salt distribution (intervention) districts versus only iodized salt consuming (control) districts of Uttar Pradesh

Ujwala M Godbole[1], Nachiket M Godbole[2], Satish B[2] & Mahesh Kumar Basantani[1]

1 Faculty of Biosciences, Institute of Bio-science and Technology, Shri Ramswaroop Memorial University, Lucknow-Deva Road, Barabanki 225003.

2 Department of Microbiology and Endocrine surgery, SGPGIMS, Lucknow 226014 Email: mkbasantani@gmail.com.

PP18: biochemical studies on kodo millet (*Paspalum scrobiculatum* L.)

Shikha Yadav*[1] & Sanjiv Kumar Maheshwari [1], 1 Faculty of Bio-Sciences, Institute of Bio-Sciences and Technology, Shri Ramswaroop Memorial University, Lucknow-Deva Road, Barabanki, India.

PP 19: biochemical characterization of partially purified acid phosphatase from germinating chickpea (*Cicerarientum*) seeds

Priya Singh, & Sonia Chadha, Amity Institute of Biotechnology, Amity University, Uttar Pradesh, Lucknow Campus. (AIB Communication No.: AIB/PC/2019/253), Email: schadha@lko.amity.edu.

PP 20: does S-locus receptor kinase (SRK) have role beyond self-incompatibility in *Arabidopsis thaliana*?

Subhankar Biswas, Raju Mondal, & Yogesh Mishra*, Department of Botany, Centre of Advanced Study in Botany, Institute of Science, Banaras Hindu University, Varanasi-221005, India, *E-mail: ymishra@bhu.ac.in.

PP 21: effect of salinity stress on seed germination and early growth of *Linumusitatissimum* L

Saijasi Dubey* & Atul Bhargava, Amity Institute of Biotechnology, Amity University Uttar Pradesh, Lucknow, Lucknow-226028(AIB/RA/2019/240), *Email: saijasidubey@gmail.com.

PP 22: anti-inflammatory effect of metabolites from two members of family Bignoniaceae

Varsha P. Wadegaonkar* and Prasad A. Wadegaonkar, Department of Biotechnology, Sant Gadge Baba Amravati

University, Amravati 444602 (Maharashtra), *Email: varshawadegaonkar@sgbau.ac.in.

PP 23: biocontrol of isolated fungal plant pathogen from sigatoka leaf spot disease of banana and sooty mould disease of mango

Namrata Singh & Sunil Kumar, Faculty of Bio-Sciences, Institute of Bio-Sciences and Technology, Shri Ramswaroop Memorial University, Barabanki (UP), India, Email: atarmanhgnis@gmail.com.

PP 24: biofloc technology: an advanced and emerging prospective in the field of sustainable aquaculture

Sudhir Kumar & P.K. Srivastava*, Institute of Bio-Sciences and Technology, Shri Ramswaroop Memorial University, Barabanki, UP-225003, India, Email: praveen2ku@gmail.com.

PP 25: mass propagation of *Aerides multiflora* via tissue culture technology

Ankita Lal[1], Manu Pant[2], L.M.S. Palni[3] & Anil Kumar[3], [1]Department of Biotechnology and [2]Department of Life Sciences, Graphic Era (Deemed to be University), Dehradun, [3]Department of Biotechnology, Thapar Institute of Engineering & Technology (Deemed to be University), Patiala, Email: ankita.lal88@gmail.com.

PP26: comparative efficacy of turmeric oil with and without curcumin against *staphylococcus aureus*

Ritu Raj[1], S. P Singh[1], Shivani Mishra[2], Anuj Shukla[2], Abhay Narayan Tiwari[3], Dinesh Kumar[1]*, [1]Centre of Biomedical Research (CBMR), SGPGIMS Campus, Raibareli Road, Lucknow-2 Department of Biotechnology, BBAU, Vidya Vihar, Raibareli Rd, Lucknow-226025, Uttar Pradesh, India, 3 Harsh Ayurvedic, 1/93, Vinay Khand, Gomti Nagar, Lucknow - 226010, Uttar Pradesh, India, Email: riturajbio444@gmail.com.

PP27: 'Isolation and screening of keratinolytic bacteria for enhanced production of keratinase

Latafat[1], Archana Vimal[2], Mohd. Haris Siddiqui[2] & Prachi Bhargava[1], [1]Institute of Bio-Science & Technology, Shri Ramswaroop Memorial University, Lucknow Deva Road, Barabanki-225003 U.P. India, [2]Department of Bioengineering, Integral University, Kursi Road Lucknow-226026, U.P. India.

PP28: role of injury associated micro-RNAs in the urinary exosomes in the diagnosis of kidney diseases

Manju Kumari, Department of Molecular Medicine & Biotechnology, Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow, India, 226014.

PP29: measurement of tree seedling growth in dry tropical environment of Lucknow

Vasundhara Singh and Mahesh Kumar Basantani, Faculty of Bio-Sciences, Institute of Bio-Sciences and Technology, Shri Ramswaroop Memorial University, Barabanki (UP) India, Email: singhvasu27@yahoo.com.

PP 30A: association of CyclinD1 gene polymorphism with the risk of oral malignancy in North Indian population

Somali Sanyal* & Kumud Nigam, Amity Institute of Biotechnology, Amity University Uttar, Pradesh, Lucknow Campus, Lucknow-226028, India (AIB Communication No AIB/RA/2019/246 ...), Email: ssanyal@lko.amity.edu.

PP 30B: investigation of the effects of salicylic acid on physiological and biochemical parameters in tomato to glyphosate herbicide

Himani Singh, Shri Ramswaroop Memorial University, Barabanki, Lucknow.

PP 31: antifungal activity of mixtures of essential oils against dermatophytes

Pankaj Saxena, Department of Agriculture & Veterinary Science, Jayoti Vidyapeeth Women's University, Jaipur, Email Id: kamalrocks3@gmail.com.

PP 32: study of Antiviral compounds of *Azadirachtaindica* against dengue virus envelope protein E using molecular docking

Sonali Gupta, Varsha P. Wadegaonkar & Prasad A. Wadegaonkar, Department of Biotechnology.

Sant Gadge Baba Amravati University, Amravati 444602, Email: prasadwadegaonkar@sgbau.ac.in.

PP 33: effect of commercial probiotics *Bacillus clausii* on the growth of Indian major carp *Labeo rohita*

Juveriya Israr & P. K. Srivastava*, Institute of Bio- Sciences and Technology, Shri Ramswaroop Memorial University, Barabanki, UP-225003, India, Email: juveriyaisrar2016@gmail.com.

PP 34: Antimicrobial activities of silver nanoparticles synthesized from *Catharanthus roseus* leaves extract

Monika Gupta[1]*, Rajesh Singh Tomar & Raghvendra Kumar Mishra, Amity Institute of Biotechnology, Amity University Madhya Pradesh, Gwalior, Department of Biotechnology, Invertis University, Bareilly, Email: biotech.monikaphd@gmail.com.

PP 35: studies on the application of *Punica granatum* peel as a bio-active compound

Taufeeq Ahmad*,[1], Saba Siddiqui[2] & Sanjiv Kumar Maheshwari[1], *- Research Scholar.

1-Faculty of Biosciences, Institute of Biosciences and Technology, Shri Ramswaroop Memorial University, Barabanki (UP), 2-Integral Institute of Agriculture Science & Research Technology (IIAST), Integral University, Lucknow (UP).

PP 36: A comparative study on production of biodiesel from edible and non-edible oils

Animesh Singh & Soumya Srivastava*, Department of Biotechnology, S R Institute of Management & Technology, Sitapur Road, Lucknow, Email: saumyasrivast@gmail.com.

PP 37: CCR2 inhibition modulates microglia activation phenotype and reduces neuronal cell death following experimental Japanese encephalitis viral infection

Swati Singh, Gajendra Yadav, Swasti Tiwari, Alok Kumar, Department of Molecular Medicine Biotechnology, Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow-226024, U.P, India, Email: aloksgpgi@gmail.com.

PP- 38: Role of epigenetic regulation in steroid non-responsiveness in nephrotic syndrome(s) patients

Kritika Singh[1], Harshit Singh[1], Akhilesh Jaiswal[2], Narayan Prasad[2], Vikas Agarwal[1], Department of Clinical Immunology[1] Department of Nephrology[2] Sanjay Gandhi Post Graduate of Institute of Medical Sciences, Lucknow, Email: kritika0103@gmail.com.

PP39: characterization of a cholesterol oxidase producing strain isolated from soil sample

Ameren Khan & CKM Tripathi, Faculty of Biosciences, Institute of Bio-Science & Technology, Shri Ramswaroop Memorial University, Lucknow-Deva Road, Barabanki, Uttar Pradesh -225003, India, Email: amreenkha01@gmail.com.

PP 40: comparative analysis of cervical cells in response to hpv16 and hpv18: A network based approach

Shikha Suman[1], Anurag Kulshrestha[2], Tanvi Jain[3] and Abhishek kulshrestha[3], [1]Indian Institute of Information Technology, Allahabad-211012, India, [2]Indian Institute of Management, Kashipur-244713, India, [3]Shri Ramswaroop Memorial University, Lucknow-Deva Road –225003, India, Email: tanvijain87@gmail.com.

PP41: protection of human skin against UV B rays using natural extract of *Tagetes patula*

Deepshikha Kushwaha[1]*, Yashodhara Verma[2], P. W. Ramteke[3], V.M. Prashad[4], Department of Biochemistry and Biochemical Engineering, Sam Higginbottom University of Agriculture, Technology and Sciences (SHUATS), Allahabad, Corresponding Author: Deepshikha Kushwaha Mail. id for correspondence: deep_shikha200@yahoo.com; deepshikhak200@gmail.com.

PP42: coccoid cyanoprocaryotes of rice fields of Tripura and their biotechnological potential

Kuntal Sarma 1 and Rama Kant 2*, 1 Department of Botany, RK Mahavidyalaya, Kailashahar, Unakoti (t) india, 2 Department of Botany, Chaudhary Charan Singh University, meerut, india. *Corresponding author: ramakant.algae@gmail.com.

PP43: A study on biochemical properties of Rhizobia and PGPR on pigeon pea (*Cajanus cajan L.*)

Nootan Singh 1, R. K. Singh 2, Neeraj Gupta 3, 1,3Institute of Biosciences and Technology, Sri Ramswaroop Memorial University, Lucknow -Deva Road, Barabanki, UP, India, 2 Department of Genetics & Plant Breeding, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi-221005, UP, India, E-mail: neeraj.itbhu@gmail.com.

PP44: *In silico* analysis of transcriptional regulation of SAM pointed domain ETS factor (SPDEF) gene and its interaction network

Nootan Singh, Kopal Jain, Shweta Nigam & Divya Gupta*, Faculty of Biosciences, Institute of Biosciences and Technology, SriRamswaroop Memorial University, Lucknow Deva Road, Barabanki, UP-225003, Email*: guptadivya06@gmail.com.

PP45: effect of bavistin a fungicide on the growth and nodulation of *Vigna mungo L*

Rachna Chaturvedi, Amity Institute of Biotechnology, Amity University Uttar Pradesh, Lucknow 226028, Email: rchaturvedi1@lko.amity.edu.

PP46: quercetin and tryptanthrin: the two broad-spectrum anticancer agents potential role in future chemotherapeutic interventions

Anjali Singh, Kamla Nidhi Rai & Sunil Kumar, Faculty of Bio-Sciences, Institute of Bio-Sciences and Technology, Shri Ramswaroop Memorial University, Barabanki (Uttar Pradesh), India, Email: anjalisinghkarishma28@gmail.com.

PP47: Anticancer Properties of *Allium sativum* and *Allium cepa*

Pratiksha & Sunil Kumar, Faculty of Bio-Sciences, Institute of Bio-Sciences and Technology, Shri Ramswaroop Memorial University, Barabanki (UP), India, Email: pratiksha.dubey95@gmail.com.

PP48: comparative proteomic analysis of bone marrow interstitial fluid in acute promyelocytic leukemia using label free quantitative proteomics

Jyoti Srivastava[1], Srikanth Rapole[2] & Sunil Kumar[3], [1]Faculty of Biotechnology and [3]Faculty of Bio-Sciences, Institute of Bio-Sciences and Technology, Shri Ramswaroop Memorial University, Barabanki (UP) India, [2]National Centre for Cell Science, Pune (Maharashtra) India, Email: jyosri0510@gmail.com.

PP49: role of enzymes in bioremediation of contaminated paddy soil

Shubhangi Singh* & Sunil Kumar, Faculty of Bio-Sciences, Institute of Bio-Sciences and Technology, Shri Ramswaroop Memorial University, Barabanki (UP), India, Email: shubhangisingh0021@gmail.com.

PP50: green bioplastics as part of a circular bioeconomy

Soma Ojha & Sunil Kumar, Faculty of Bio-Sciences, Institute of Bio-Sciences and Technology, Shri Ramswaroop Memorial University, Barabanki (India), Email: somaojha19@gmail.com.

PP 51: three — dimensional modeling of human neurodegenerative: brain or ganoids coming of age

Mamta Gupta & Sunil Kumar, Faculty of Bio-Sciences, Institute of Bio-Sciences and Technology, Shri Ramswaroop Memorial University, Barabanki, India, Email: tames9870@gmail.com.

PP52: potential utilization of biowastes in vermicompost production and its effect on growth parameters of plants

Siddharth Vats*[,1], Namrata Budhiraja[1], Priyanshi Srivastava[1], Divyanshu Shukla[1], & Priyanaka Babbar[1], Prachi Saxsena[1], Shiva[1], Tuba Rizwi[1], [1] Faculty of Biotechnolgy, IBST, IBST, Shri Ramswaroop Memorial University, Lucknow 226003, India. Email: vatssidd@gmail.com.

PP53: association of Hras gene polymorphism with the risk of pre oral cancer (*Lichen Planus*) in North Indian population

Kumud Nigam* & Somali Sanyal, Amity Institute of Biotechnology, Amity University Uttar Pradesh, Lucknow Campus, Lucknow-226028, India (AIB Communication No 255), Email: knigam@lko.amity.edu.

PP54: PCR amplification of fungal xylanase genes

Shruti Dwivedi & Dinesh Yadav*, Gene Cloning and Expression Lab, Department of Biotechnology, D.D.U. Gorakhpur University, Gorakhpur (U.P.) 273 009, INDIA, *E-mail: dinesh_yad@rediffmail.com.

PP55: potential of *Coccinella septempunctata (Coccinellidae, Coleoptera)* as biological control of insect pests of *Brassica* sp.

Reena Bahan, and Shashidhar Singh, Department of Zoology, College of Commerce, Patna (Bihar) 800020, India, E-mail: reena.bahan@rediffmail.com.

PP56: O-Hexadecyl-dextran-encapsulated berberine potentiates anticancer activity in human cancer cells and *Ehrlich ascites* carcinoma bearing mice

Madhulika Singh 1 & Yogeshwer Shukla 2, 1 Present address: Maharishi University of Information Technology, IIM Road, Lucknow (India)-2260132 Proteomics Laboratory, CSIR-Indian Institute of Toxicology Research, PO Box 80, MG Marg, Lucknow (India)-226001, Email: madhulika.anil@gmail.com.

PP57: therapeutic efficacy of entrapped extract of Bael in nanoparticles against Ccl4 induced hepatic damage in rats

Monika Sharma 1*, Ishita Yadav 2, 1*Department of Bioscience and Biotechnology, Banasthali Vidyapith, Banasthali, Rajasthan, India-304022, 2 Institute of Agriculture sciences, SAGE University, Indore, M.P., India-452020, Email: monica_202005@rediffmail.com.

PP58: association of MMP1 polymorphism with risk of lung cancer in Indian population

Priyanka Gaur 1, Sandeep Bhattacharya 1, Surya Kant 2 & Sarika Pandey 2, Department of Physiology 1, Department of Respiratory Medicine 2, King Georges Medical University, Lucknow Email: priyankagaur343@gmail.com.

PP59: evaluation of vitamin D levels and health related quality of life in women with COPD-A hospital-based study

Sarika Pandey 1, Rajiv Garg 1, Surya Kant 1, Priyanka gaur 2, Ajay kumar verma 1.

1 Department of Respiratory Medicine, King George's Medical University, Lucknow- 226010, Uttar Pradesh, India.2 Department of Physiology, King George's Medical University, Lucknow- 226010, Uttar Pradesh, India.

Email: sarikapandey08@gmail.com.

PP60: echocardiographic evaluation of stable chronic obstructive pulmonary disease (COPD) patients

1Hemant Kumar, 2 Ajay Kumar Verma, 2Anuj Kumar Pandey, 2Surya Kant, 3Arpita Singh.

1 Department of Respiratory Medicine, Dr. Ram Manohar Lohia Institute of Medical Sciences, Lucknow, Uttar Pradesh, India, 2 Department of Respiratory Medicine, King George's Medical University, Lucknow, Uttar Pradesh, India, 3 Department of Pharmacology, Dr. Ram Manohar Lohia Institute of Medical Sciences, Lucknow, Uttar Pradesh, India, Email-pandeyanuj020@gmail.com.

PP61: screening and molecular characterization of Laccase-producing fungi from soil

Deepti Singh & Neeraj Gupta, Faculty of Bio-Sciences, Institute of Bio-Sciences and Technology, Shri Ramswaroop Memorial University, Lucknow-Deva road, Barabanki UP, India, Email: neeraj.itbhu@gmail.com.

PP62: A review on the lactic acid bacteria in different sources of curd

Shanika Mukherjee[1], Shivani Singh Sengar[1] and Sunil Kumar[2], [1]Faculty of Biotechnology and [2]Faculty of Bio-Sciences, Institute of Bio-Sciences and Technology, Shri Ramswaroop Memorial University, Barabanki (Uttar Pradesh) India Email: shanika2497@gmail.com.

PP63: microbial bioremediation of plastic wastes and its conversion into liquid fuel

Neha Tiwari, Siddhant Srivastava, Sunil Kumar, Faculty of Bio-Sciences, Institute of Bio-Sciences and Technology, Shri Ramswaroop Memorial University, Barabanki (Uttar Pradesh), India Email: nehatiwari0908@gmail.com.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.gendis.2019.10.015.

Sunil Kumar*
Shri Ramswaroop Memorial University, Biotechnology,
Lucknow-Deva Road, Hadauri, Tindola District,
Lucknow, 225003, India

*Faculty of Bio-Sciences, Institute of Bio-Sciences and Technology, Shri Ramswaroop Memorial University, Lucknow-Deva Road, Hadauri, Tindola District, Barabanki, Uttar Pradesh 225003, India
E-mail address: sunil.bio@srmu.ac.in

22 October 2019
Available online 2 November 2019