TRendys Meeting Report - 2013

The 20th Annual Meeting of TRendys 2013 was organized by the University of Hyderabad, Hyderabad on November 22-23, 2013 to discuss emerging concepts in Molecular Biology, Biochemistry, Chemical Biology, Immunology, Infectious diseases and Nano-formulations. For the first time, the chairpersons were programmed to give a short account of an emerging area to start the session. The organizing team comprised of Prof. N Siva Kumar, Prof. Musti J Swamy and Prof. Anand K Kondapi of University of Hyderabad.

The programme started with the welcome address by Prof N. Siva Kumar and a brief presentation on the genesis of ‘TRendys’ by Prof K Subba Rao on how this activity, started as informal meetings of a group of scientists in the Department of Biochemistry at IISc (Bangalore), developed into a national forum. The talks and discussions on new developments in the broad discipline of life sciences are aimed at provoking curiosity, thinking and inquiry in the audience. The speakers were advised not to present their experimental data as in other meetings. In his inaugural address, Prof Ramakrishna Ramaswamy, the Vice-Chancellor of University of Hyderabad, emphasized the need for wide participation of students in meetings of this nature and offered his support to such activities. Prof. T Ramasarma in his remarks on current trends in research communications pointed out importance of openness in dissemination of results by investigators as well as Journals. The inaugural session was concluded with vote of thanks by Prof. M J Swamy.

The scientific programme was organized for two days with five sessions. It has been the practice from 2004 that the first lecture, known as “TRendys Oration”, is given by a scientist specially invited for the purpose. The first session was chaired by Prof. A J Rao (IISc, Bangalore) with an opening note on loss of reproductive memory due to effects of estrogens on the brain sex differentiation. This year’s ‘TRendys oration’ was delivered on “Dynamics in the Genome Landscape: Spatial Changes that Relate to DNA Repair and Transcription” by Dr. B J Rao (Department of Biological Sciences, Tata Institute of Fundamental Research, Mumbai). In his lecture, he demonstrated that the spatial changes are not limited to whole chromosomes, but are at specific genetic loci when subjected to transcriptional modulations, and that neuronal activation triggers dynamic changes in specific set of genetic loci (Fig. 1).

Session 2 was chaired by Prof. P Kondaiah of (IISc, Bangalore). Dr. Abhijit Chakrabarti (Saha Institute of Nuclear Physics, Kolkata) presented a talk on “Erythrocytes, Hematological Disease, Proteomics & Chemical Biology” focusing on Sickle cell disease (SCD), Hbβ-thalassemia and α-hemoglobin stabilizing protein (AHSP), discussed various aspects of possible roles of redox regulators and the chaperone proteins inside the red blood cells. Dr. Amitabha Chattopadhyay (CCMB, Hyderabad) under the title “Life Beyond Bloch Hypothesis: Cholesterol-producing Yeast” described a novel
system for heterologous expression of cholesterol-dependent proteins and receptors in yeast that can make yeast strains, which normally do not have cholesterol, produce cholesterol.

In her talk entitled “Some Like it Fat And Sweet. Glycolipid Anchors on Proteins” Dr. Sneha Sudha Komath (Jawaharlal Nehru University, New Delhi) spoke about glycosylphosphatidyl inositol (GPI) anchors which are essential in lower eukaryotes for their viability, as well as virulence. Her presentation provided details of the structure of the GPI anchor, its likely functions, its biosynthesis and transfer to proteins in the endoplasmic reticulum and its journey to the plasma membrane/cell wall, and also brought out the exciting challenges in this area.

Session 3 was chaired by Dr. V Prakash (Mysore). In this session, Dr. Srinivas Hotha (IISER, Pune) talked on “Binary and Ternary Bioconjugation”. He discussed about the application of bioconjugation of molecules for studying various cellular events, such as protein-protein interactions, imaging of cells, and also the various chemical reactions used in bioconjugation. Although methods for multi- and poly-valent display of single molecule exploiting dendrimers, nanoparticles, calixarenes etc as templates are well-known, stepwise conjugation of molecules to get ternary complexes in a modular fashion is still a formidable challenge. Dr. A. Gopala Krishna (IIT Madras) gave a presentation on “The ‘Magic Bullet’s’ Moksha!” dealing with G protein coupled receptors, which are the largest group of target molecules for drugs in the market. He discussed the historical developments, travails and tribulations, leading to our present day understating of the structure and function of these cell surface receptors, involving multiple disciplines that led to the Nobel Prize in Chemistry for 2012.

Session 4 was chaired by Prof. Geeta Vemuganti (University of Hyderabad). The talk of Prof. D N Rao (IISc, Bangalore) on “Catayltic Antibodies: Concept and Promise” brought a new hope and purpose for the antibodies present in the blood and mucosal secretions of humans with proteolytic and other catalytic activities. He explained how specific catalytic antibodies become feasible, if one combines the natural reactivity and non-covalent recognition of epitope regions remote from the reaction center, a basis for activities of immune system. Indeed, proteolytic antibodies specific for thyroglobulin and prothrombin have been reported in patients with Hashimoto’s thyroiditis and multiple myeloma, respectively. Nucleic acid hydrolyzing antibodies have been isolated from the serum of patients with systemic lupus erythematosus, multiple sclerosis and rheumatoid arthritis. A homeostasis role is a distinct possibility for catalytic antibodies developed in pathological conditions. Thus, development of highly proficient abzymes will have implications in the treatment of infectious, alloimmune and autoimmune disorders.

In his talk entitled “Fast and Furious Methods of Protein Engineering, our Flip”, Dr. N Madhusudhan Rao (CMMB, Hyderabad) described the methods of protein engineering, especially highthrough methods in order to evolve specific proteins and peptides. The developed methodology was rapid and allowed quick identification of mutant proteins by mass spectrometry. Prof. Dipankar Nandi, (IISc, Bangalore) talked about the standardization of an in vivo model of thymic atrophy post-oral infection with live S. typhimurium and the mechanisms involved in the loss of CD4+CD8 + thymocytes and thymic atrophy that revealed the role of glucocorticoids and interferon-gamma and led to identification of a stress-induced signaling kinase.

Session 5 was chaired by Prof. T. Suryanarayana (University of Hyderabad). Prof. Dulal Panda (IITBombay, Mumbai) in his presentation on “Regulation of Microtubule Dynamics by MAPs and Small Molecule Inhibitors: Implication in Cancer Chemotherapy” focused on the dynamics of the microtubules that are involved in various cellular functions, such as the cell architecture, intracellular trafficking, and mitosis. He showed evidence on the role of LC8 protein, a component of dynein motor protein, in regulating microtubule microdynamics and on the effective role of inhibitors of microtubule dynamics as tools for arresting mitosis, and thereby cancer growth. Prof. Santosh K Kar (School of Biotechnology, KIIT University, Bhubaneswar) gave a talk on “Conventional Antibiotic Therapy of Tuberculosis Cures the Patients But Leaves Them Defenseless”. His presentation focused on the screening of plant extracts, with few side-effects, for anti-tuberculosis activity, enhanced by nanoparticles.
The meeting ended with the closing session of vote of thanks by Prof. A K Kondapi, the convener of the meeting, and words of appreciation by the guests and the steering committee members for the successful 20th Annual Meeting of TRendys.

N Siva Kumar, M J Swamy and Anand K Kondapi
University of Hyderabad, Hyderabad-500 046

E-mail: nsksl@uohyd.ernet.in, mjssc@uohyd.ernet.in, akksl@uohyd.ernet.in

Prof. Kalluri Subba Rao, National Convener for TRendys
INSA-Hon Scientist, School of Medical Sciences
University of Hyderabad, Hyderabad-500 046
E-mail: ksrbrain@gmail.com; ksrsl@uohyd.ernet.in