

## **“Recent Advances in Proteomics”**

18<sup>th</sup> March 2015

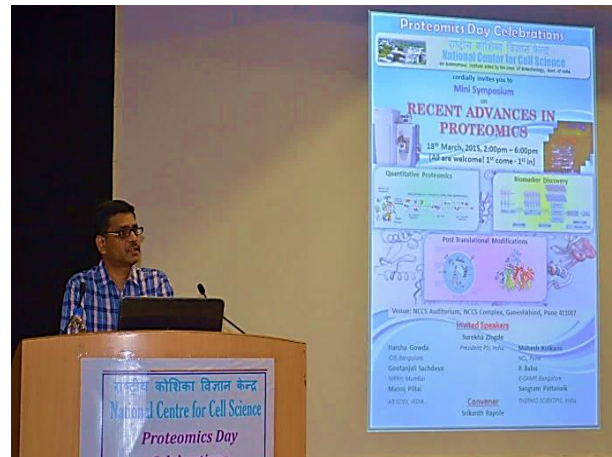
**A mini symposium organized by National Centre for Cell Science (NCCS), Pune on the occasion of “Proteomics Day” in association with Proteomics Society, India.**

**Convener: Dr. Srikanth Rapole, Scientist, Proteomics Lab, NCCS, Pune.**

The world of ‘proteomics’ technologies is increasing day by day with the introduction of new technologies, thereby enhancing the scope of scientific research related to ‘proteomics’. Current progress in proteomics has been largely due to recent developments in mass spectrometry based technologies. ‘Proteomics’ technologies are not new to scientist in the research community, but majority of the young students, undergraduates, college faculties and clinicians are not so familiar. A mini symposium on “Recent advances in Proteomics” on the occasion of Proteomics Day was organized at the National Centre for Cell Science, Pune on 18<sup>th</sup> March 2015 in association with the Proteomics Society, India. The main objective behind this mini symposium was to make aware the local scientific community, students, faculty from NCCS, and neighboring institutions including colleges about the recent advancements in the proteomics world. The mini symposium was comprised of a series of lectures from eminent scientists working in various genres of proteomics research in India. The mini symposium was attended by more than two hundred and fifty participants including teachers, students, and clinicians from Pune.



**Dr. Srikanth Rapole**, Scientist, NCCS, Pune and the Convener of this event briefed the audience about the importance and objectives behind organizing this event. He expressed the need for awareness about the new technological advances in the Proteomics for undertaking world class research. He emphasized the fact that improvements in mass spectrometry techniques permit studying in detail the proteome including post-translational modifications. This was followed by the series of five lectures by the eminent scientists from India working on various areas of proteomics and two lectures from representatives of world leader mass spectrometry companies.



The inaugurating lecture was delivered by **Dr. Surekha Zingde**, President, Proteomics Society, India (PSI). In her presentation, Dr. Zingde elaborated on the importance of Human Proteomics Project of the Human Proteome Organization (HUPO) and technological advancements in mass spectrometry, bioinformatics (knowledge base), the Human Protein Atlas and finally proteomics research in India. In the second part of her talk she discussed on the research carried out by her lab in the area of oral cancers. She emphasized on the fact that diagnosis of oral cancer is not an issue but there is a need for predictive and prognostic biomarkers. She spoke about some aspects of her research which involved tissue proteomics, keratins and autoantibodies in circulation. In addition, she also briefed about Proteomics Society, India and its activities among the proteomics researchers.



**Dr. Harsha Gowda** from Institute of Bioinformatics, Bangalore, very elegantly presented his recent work about a draft map of human proteome using high resolution mass spectrometry. He also discussed about phosphoproteomics and its capabilities to characterize signaling pathways. He emphasized on the revolutionizing capabilities of the modern mass spectrometry



which has made high-throughput research in proteomics possible. He discussed about the power of phosphoproteomics approach used for characterizing aberrantly activated signaling pathways in cancers.

**Dr. Geetanjali Sachdeva** from National Institute for Research in Reproductive Health, Mumbai, delivered her talk about the role of endometrium in women reproductive health. She spoke on the need to identify molecules that are differentially expressed in the receptive phase endometrium which subsequently will help in the understanding of the mechanisms by which endometrium



becomes receptive and also the identity of the markers of receptivity for infertility management. She briefed about her research involving the various proteomics approaches undertaken to identify the proteins present in uterine fluid during the receptive phase. She also discussed about need to profile the uterine secretome using proteomic approaches, considering the potential of uterine secretome in determining the functional status of the endometrium.

**Dr. Mahesh Kulkarni** from National Chemical Laboratory, Pune, explained about chemical and biological strategies to reduce Advanced Glycation End (AGEs) products. He talked about the process of glycation leading to the formation of heterogeneous advanced glycation end products (AGEs) and its implication in various diseases including aging, diabetic complication, and



neurodegenerative diseases. He discussed about protein aggregation and formation of protease resistant proteins (PRPs) as a result of glycation. He demonstrated from his research findings that the accumulation of protein aggregates is an inevitable consequence of impaired proteasomal activity and protease resistance due to AGE modification. He emphasized that these findings will provide a new dimension for developing intervention strategies for the treatment of glycation associated diseases such as diabetes complications, atherosclerosis, and aging.

**Dr. P. Babu** from Centre for Cellular and Molecular Platforms, Bangalore, deliver his lecture on a recent aspect of proteomics namely, identifying glycan modifications in proteins. His talk was on structural characterization of N- and O-Glycans and their role in Hydra Regeneration. He very elegantly described about the diversity of glycans attached to glycoconjugates which



drive many of the processes involved in development, homeostasis and diseases. Structural characterization of the glycans is foremost step in understating their functions and recent advances in mass spectrometry play an important role in this area. Cell-cell communications, cell-matrix interactions and cell migrations play a major role during regeneration. However, little is known about the molecular players involved in these critical events, especially the cell surface glycans. He presented the data related to the role of polyfucosylated glycan-receptor interactions in the regeneration.



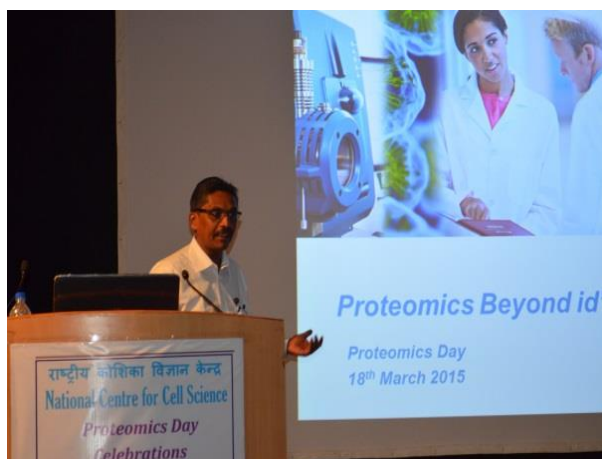
**Mr. Sangram Pattanaik** from Thermo Fisher Scientific India Pvt. Ltd., Mumbai, spoke about recent advancement in Orbitrap Mass spectrometry for complex Proteomics. He introduced the audience to the orbitrap fusion tribrid mass spectrometer which has three mass analysers working together to produce unmatched analytical performance.

He made the audience understand the capabilities and power of orbitrap fusion tribrid mass spectrometer for those facing the most difficult analytical challenges in cell biology, proteomics and structural analysis.



**Dr. Manoj Pillai** from AB Sciex India, New Delhi, spoke about the Next-Gen Proteomics Platform. He introduced the audience to the SWATH acquisition on Triple TOF mass spectrometer to overcome the limitations in shotgun proteomics and targeted proteomics. He demonstrated the technology of SWATH-MS through his lecture and conveyed the advantages of SWATH-MS

including broader dynamic range, improved mass accuracy stability, and high resolution. He also introduced new swath proteomics cloud toolkit to combine genomics information with proteomics information.



The event was formally concluded by vote of thanks from **Dr. Jyoti Rao**, Scientist, NCCS, Pune. She thanked all the invited speakers, participants, the Proteomics Society, India and the volunteers of the event for making it a success.





*The photographs of all the invited speakers and the team of volunteers for the event along with the invited speakers.*