Vol. 12/No. 2/July - Dec, 2024



PROTEOMICS SOCIETY, INDIA (PSI)

NEWSLETTER



EDITORS

Dr. Amol R. Suryawanshi, Dr. Niranjan Chakraborty, Dr. Alka Rao, Prof. Renu Deswal, & Dr. Manas Santra

Content

a						
5	P	C	11	0	n	
\sim	-	-	-	v		

Proteomics Society, India (PSI) - Executive Council				
Editor's message	4			
Message from President, PSI	5			
 PSI 16th Annual Meeting Report PSI 16th Annual meeting and Conference at CSIR-NCL, Pune. PSI Education day at BRIC-NCCS, Pune. PSI Pre-conference workshop on Proteomics at BRIC-NCCS, Pune. 	6			
 Proteomics Symposium and Workshop Reports "National Symposium and Workshop on clinical proteomics" at BRIC-ILS, Bhubaneswar. "Workshop on Metabolomics" at Yenepoya (Deemed to be university), Mangalore. Symposium on "Pioneering the Future of Healthcare and Diagnostics Using 4D Omics" at IIT Bombay, Mumbai. "Nano-proteomics workshop: Training workforce for sustainable and stress-resilient crop production" at University of Delhi, Delhi 	11			
 Upcoming events 17th Annual Meeting of Proteomics Society, India and International Conference- 2025 at Yenepoya Research Centre, Mangalore. Advances in Proteomics Technologies - 2025 with International Conference and Workshop at IIT Bombay, Mumbai. 	19			
PSI Cross Word Puzzle – 1 • Thema: Proteomics milestones	20			
 Information about PSI Details of Proteomics Society, India (PSI) Journal of Protein and Proteomics (JPP) 	21			

Page No

PSI Office-Bearers & Executive Council

PRESIDENT

Dr. Shantanu Sengupta

VICE PRESIDENTS

Dr. Srikanth Rapole

Dr. Suman Kundu

GENERAL SECRETARY

Dr. Tushar Kanti Maiti

TREASURER

Dr. Swasti Raychaudhuri

JOINT SECRETARY

Dr. Srinivas Kiran Ambatipudi

PAST PRESIDENTS OF PSI

Dr. Ravi Sirdeshmukh (Founder President)

Dr. Surekha Zingde

Dr. Utpal Tatu

Dr. Subhra Chakraborty

MEMBERS

Dr. Subhra Chakraborty Dr. Arun Bandyopadhyay Dr. Ashok Kumar Mohanty Dr. Rakesh K. Mishra Dr. Surekha Zingde Dr. Mahesh J. Kulkarni Dr. Niranjan Chakraborty Dr. Debasis Dash Dr. Amol R. Suryawanshi Dr. Ramesh Ummanni Dr. Alka Rao Dr. Amit Yadav Dr. Trayambak Basak Dr. Ashis Kumar Mukherjee Dr. Keshava Prasad

Editor's Message

Dear PSI members,

It gives us great pleasure to present the latest issue of the PSI newsletter. As we continue to advance the field of proteomics in India, this edition showcases the remarkable progress our community has made over the past year, highlighting key research, developments, and upcoming events.

Firstly, we are thrilled to share that the report of 16th Annual Meeting and International Conference of PSI held at CSIR-NCL, Pune, from November 21-23, 2024. The event brought together leading researchers, scientists, and professionals from across the globe to exchange knowledge and ideas. Additionally, PSI Education Day was hosted at BRIC-NCCS, Pune on November 19, 2024, which focused on the latest trends in proteomics education and training. Prior to the conference, a Pre-conference Workshop was also held at BRIC-NCCS, Pune from November 18-20, 2024, providing a great platform for hands-on learning and networking.

In addition to the Annual Meeting, we are excited to report on several successful events that have taken place over the past year. The National Symposium and Workshop on Clinical Proteomics at BRIC-ILS, Bhubaneswar from August 20-23, 2024 was a resounding success, fostering discussions on the role of proteomics in clinical applications. During this period, we are reporting another three workshops. Workshop on Metabolomics was held at the Yenepoya Research Centre, Mangalore on September 03-05-2024 and the highly engaging 4D Omics Workshop on November 12, 2024, held at IIT Bombay, Mumbai where experts explored cutting-edge advancements in different aspects of omics. Another notable event was the Plant Proteomics workshop held at the Department of Botany, Delhi University where participants delved into the latest developments in plant proteomics.

Looking ahead, we are excited to announce the 17th Annual Meeting of PSI, set to take place in 2025 at the Yenepoya Research Centre, Mangalore, a major event on the global proteomics calendar, and Advances in Proteomics Technologies (APT) 2025 workshops and International Conference will take place at the IIT Bombay, Mumbai. These events will offer further opportunities for knowledge exchange, collaboration, and advancing the proteomics field in India and beyond.

In this newsletter, we are introducing PSI Crossword Puzzle series for members to stimulate themselves with proteomics knowledge and have a scientific fun. The first PSI Crossword Puzzle is with theme: Proteomics Milestones and we are sure that you will find this interesting.

We hope you enjoy the collation. Your feedback will be much appreciated.

Thank you and Regards,

Dr. Amol R. Suryawanshi, Dr. Niranjan Chakraborty, Dr. Alka Rao Prof. Renu Deswal Dr. Manas Santra

Message from President, PSI

Dear Members of the Proteomics Society of India,

I am excited to share with you the highlights of recent events and upcoming activities of the Proteomics Society of India (PSI). The year 2024 has truly been a remarkable one, filled with enriching experiences, ground breaking research, and fruitful collaborations.

In the latter half of 2024, PSI hosted several impactful symposiums and workshops that advanced our knowledge and engagement in proteomics. The **National Symposium and Workshop on Clinical Proteomics** at BRIC-ILS, Bhubaneswar (August 20-23, 2024), offered an excellent platform for exploring the role of proteomics in clinical applications. The **Workshop on Metabolomics** at Yenepoya Research Centre, Mangalore, and the **4D Omics Workshop** at IIT Bombay on November 12, 2024, were instrumental in enhancing our understanding of multiomics approaches. Additionally, the **Plant Proteomics Workshop** held at the Department of Botany from December 24-30, 2024, marked a major milestone in advancing plant proteomics research in India.

Our flagship event, the **16th Annual Meeting and International Conference**, held at CSIR-NCL, Pune, from November 21-23, 2024, was a resounding success. The conference brought together researchers, professionals, and students from around the world to exchange ideas, showcase innovations, and foster collaborations in the field of proteomics. It was a prime opportunity for participants to engage with cutting-edge research and emerging trends.

In the lead-up to the conference, we organized **PSI Education Day** on November 19, 2024, at NCCS, Pune, focused on advancements in proteomics education and training. This event offered valuable insights for educators, students, and early-career researchers, enriching our community's knowledge base. The **PSI Pre-conference Workshop**, held from November 18-20, 2024, provided hands-on training and networking opportunities that further enhanced the conference experience.

At the conference, we made several important decisions aimed at advancing the field. One key outcome was the formation of the **MRM Consortium**, with the goal of developing MRM assays for proteins of interest. This initiative will facilitate protocol exchange and minimize duplication. Additionally, we have decided to launch a **summer training program** for students, where a select group will receive specialized training in proteomics and metabolomics. We will also introduce an **oration lecture** starting from our next Annual Meeting.

Looking ahead, we are excited about the events scheduled for 2025. **APT 2025** will be held at IIT Bombay, Mumbai, providing a unique opportunity for global proteomics professionals to gather and discuss the future of the field. We are also preparing for the **17th Annual Meeting of PSI** in 2025, which will take place at Yenepoya Research Centre, Mangalore. This promises to be another excellent occasion for knowledge exchange, networking, and collaboration.

As I reflect on a successful year gone by, I look forward to an equally dynamic year ahead. I am confident that everyone in the PSI community is energized by the latest advancements in proteomics. The **Journal of Proteins and Proteomics**, managed by PSI, will continue to be a key resource for ground breaking discoveries in protein science.

This newsletter also introduces the **PSI Crossword Puzzle Series**, designed to engage members while having fun with proteomics knowledge. The first puzzle, themed around **Proteomics Milestones**, is sure to be an exciting challenge.

I encourage greater participation from our young members to keep the spirit of PSI alive and vibrant. Let us continue to harness the power of proteomics to address key research challenges. Your new ideas and perspectives are always welcome.

I would also like to take this opportunity to warmly welcome all our new members and newly elected members of the PSI Executive Council. Your contributions will help strengthen our community, and I look forward to working together to shape the future of proteomics.

Wishing you all a successful and prosperous year ahead.

Best regards, Dr. Shantanu Sengupta President, PSI

PSI 16th Annual meeting @ CSIR-NCL, Pune

16th Annual Meeting of the PSI and International Conference on "Integrated Omics Approaches for Decoding Biological Research" On November 21-23, 2024 at CSIR-NCL, Pune Conveners: Dr. Ashok Giri and Dr. Mahesh Kulkarni

The 16th Annual Meeting of the Proteomics Society, India and the accompanying International Conference on "Integrated Omics Approaches for Decoding Biological Research," organized at CSIR National Chemical Laboratory (CSIR-NCL), Pune, from November 21-23, 2024, as part of its platinum jubilee celebration year. The conference was hosted by CSIR-NCL in association with NCCS, IISERP, SPPU, and ARI. Dr. Ashok Giri and Dr. Mahesh Kulkarni were the conference conveners.

More than 350 participants, including some of the leading researchers from India as well as from abroad, participated in the conference. The focus of this conference was to deliberate the developments in Omics technologies, as they have become indispensable for unraveling complex biological processes, and their role has become increasingly vital as we face unprecedented environmental challenges, climate change, and health crises. Omics studies enable us to gain a deeper understanding of biological systems, offering insights that are critical to developing solutions for global issues impacting both ecosystems and human health.

The day 1 started with the inaugural session. Dr. Ashok Giri, the convener of this conference and Dr. Ashish Lele, Director CSIR-NCL, gave welcome remarks, which were followed by remarks from Dr. Shekhar Mande (former DG, CSIR), Dr. Suresh Gosavi (Vice Chancellor, SPPU), and Dr. Prabodh Tiwari (Director, CSIR-CIMAP). Dr. Shantanu Sengupta, President, Proteomics Society-India) gave presidential remarks. The inaugural session concluded with a plenary talk by Prof. P. Balaram (former Director, IISc, Bengaluru). The other sessions included applications of omics technologies in Cell Biology, Human Diseases, Plant Biology, Chemical Ecology, Bio-therapeutics, Metabolomics, Bioinformatics and Artificial Intelligence.







PSI 16th Annual meeting @ CSIR-NCL, Pune

The speakers of the conference include Drs. Subra Chakraborty(NIPGER), Rakesh Mishra (TIGS), Siddhesh Kamat (IISERP), Prabodh Tiwari (CIMAP), Akhilesh Pandey (Mayo Clinic), Arun Sreekumar (Baylor Collefe of Medicine), M. V. Jagannatham (CCMB) Viren Sardana (IGIB), Prasanna Venkataraman (ACTREC), Radhika Venkatesan (IISERK), Graham Ball (Intellomx), Rakesh Joshi (NCL), Manjunath Joshi (MSLS), Sumit Biswas (BITSG), Anand Srivastava (NIAB), Shibdas Banerjee (IISERT), Kamal Mandal (GBU), Javaid Bhat (UoK), Nivedita Bhattacharya (MSIA), Kaushik Dey (St Jude Hospital), Yashwant Kumar (THSTI), Khatereh Motamedchaboki (Thermo), Jean-Baptiste (Sciex), Swarnendu Kaviraj (Gennova), Gouri Patil (DRL), Sarvannan Kumar (Thermo), Neelkanteshwar Patil (CFTRI), Smita Kurup (MAHYCO), Arun Ray (IIITD), and Abhijeet Kulkarni (SPPU). All the sessions were chaired by senior researchers who were appropriate to the specific sessions.

The conference also had a poster session, and students from various parts of the country presented more than 150 posters.

The meetings of the Executive Council and the General Body of Proteomics Society-India and the meeting with Mass spectrometry industrial partners were held on the sidelines of the conference. The Conference concluded with a valedictory function on the afternoon of the last day of the conference, Nov 23. Dr. Ashish Lele, Director, NCL, Dr. Sunil Bhagwat, Director, IISERP, and Dr. Shantanu Sengupta. Dr. Srikanth Rapole gave the conference report and Dr. Mahesh Kulkarni presented vote of thanks.



PSI Education day @ BRIC-NCCS, Pune

PSI Education Day during PSI 16th Annual Meeting On November 19, 2024 at BRIC-NCCS, Pune Conveners: Dr. Srikanth Rapole

Every year, proteomics society, India, organizes education day as a pre-conference event during their annual meetings. This is a welcome initiative undertaken by PSI to generate interest in students, researchers and clinicians as well as to make them aware about recent emerging advanced trends in proteomics and metabolomics approaches. This programme was also helpful to established scientists who wish to integrate these techniques to answer the questions which were previously unanswerable by routine methods. This year, education day program was enthusiastically arranged at Biotechnology Research and Innovation Council-National Centre for Cell Science (BRIC-NCCS), Pune during 16th Annual Meeting of the Proteomics Society, India (PSI) on 19th November 2024 with the theme of "Current Trends in Proteomics and Metabolomics". More than 100 participants took part in the event and major chunk of the candidates comprised of the students and young faculty.

The programme commenced with the welcome address by Dr. Srikanth Rapole, convenor of the education day programme who greeted all the participants and briefed them about the theme of the programme. This was followed by the inaugural message by Dr. Sharmila Bapat, Director In-Charge, BRIC-NCCS, Pune and Dr. Ashok Giri & Dr. Mahesh Kulkarni from CSIR-NCL, Pune, Conveners, PSI-2024 briefed about the PSI-2024 main conference program.

The programme was divided into four sessions in which renowned Scientists from various prestigious institutes and universities delivered invited presentations. The first session was themed around Mass spectrometry-based Proteomics. Dr. Keshava Prasad from Yenepoya Research Centre delivered inaugural lecture of the session on Mass Spectrometry basics and applications. The second lecture of the session was delivered by the Dr. Amit Kumar Yadav from BRIC-THSTI on proteomics data analysis and proteogenomics. The final lecture of first session was given by Dr. Niranjan Chakraborty on plant proteomics.

The topic of second session was clinical proteomics. Dr. Amol Suryawanshi, BRIC-ILS elaborated the clinical proteomics applications in various diseases. The second lecture of the session was delivered by Dr. Yashwant Kumar from BRIC-THSTI on metabolomics applications in various diseases. The session was concluded with participants' group photo.



PSI Education day @ BRIC-NCCS, Pune

The third session was focused on Proteomics and **Metabolomics** Applications. The session commenced with the lecture by Dr. Ravi Sirdeshmukh, from IOB. Dr. Ravi explained the proteogenomics approach to identify novel targets in Glioblastoma and Breast cancer. The next lecture of the session was delivered by Dr. Tushar Maiti from RCB, Faridabad. Dr. Tushar nicelv elaborated on post-translational modifications and special focus on ubiquitination modifications. The third lecture of the session presented by Dr. Narendra Kadoo from CSIR-NCL and covered the special topic of microbial proteomics.

The final session of the programme was centered on topic "Applied proteomics". The first lecture of the session was given by Dr. Sanjeeva Srivastava from IIT-Bombay. He presented an interesting lecture on next generation technologies and software/databases for clinical proteomics. The final lecture was delivered by Dr. M. V. Jagannadham from University of Hyderabad on the role of acetylation of peptides in enhancing protein identification and characterization.

The programme was concluded with vote of thanks proposed by Dr. Srikanth Rapole, Convenor of Education Day. Dr. Srikanth also acknowledged all the speakers, PSI EC members and participants for their contribution in making Education day a big success.





Pre-conference Workshop @ BRIC-NCCS, Pune

Proteomics Workshop during PSI 16th Annual Meeting On November 18-20, 2024 at BRIC-NCCS, Pune Conveners: Dr. Srikanth Rapole

A 3-Day hands-on training workshop organized by Proteomics facility, BRIC-NCCS, Pune on the occasion of 16th Annual Meeting of Proteomics Society, India (PSI) & International Conference from 18-20 November, 2024. This workshop was partly supported by Proteomics Society, India. Proteomics is the next generation omics tool for medical diagnostics, clinical and biological research and drug development; therefore, this workshop was aimed at introducing the young research students to the complete proteomics workflow from sample preparation to massspectrometry based untargeted and targeted quantitative proteomics including lecture series from renowned experts. Twelve participants, comprising young research scholars and faculty from all over India, took part in this workshop.

During the inauguration, Dr. Srikanth Rapole welcomed the participants and informed about the importance of proteomics techniques in today's research world. This was followed by the inaugural message by Dr. Sharmila Bapat, Director In-Charge, BRIC-NCCS, Pune. The inaugural talk was delivered by Dr. Srikanth Rapole (BRIC-NCCS, Pune) on introduction about proteomics and his research in Cancer Proteomics. In the first day, participants learned protein extraction, digestion and sample preparation for proteome analysis using mass spectrometry. Participants were also briefed about instruments available at BRIC-NCCS including Orbitrap Fusion, 6600 Triple TOF and 6500 Q-TRAP LC-MS/MS systems. The second day started by injecting the digested samples to LC-MS/MS followed by data acquisition. In addition, participants attended Education Day lectures on proteomics delivered by eminent proteomics scientists.

The third day was dedicated to providing the participants qualitative and quantitative data analysis using different mass spectrometers. Dr. Dipankar Malakar (Senior Application Scientist, Sciex) demonstrated Sciex 6600 Triple ToF and 6500 Q-TRAP instruments starting from sample submission to data acquisition and data analysis. NCCS Proteomics facility staff Dr. Vijay Kumar and Dr. Venkatesh Naik presented various applications of proteomics including data analysis. Mr. Khushman Taunk gave an in-depth insight into data analysis workflow using Orbitrap Fusion mass spectrometer. The participants have also been introduced about the steps to be carried out for raw data so as to make it analyzable by other statistical tools. This was followed by the valedictory function.

At the valedictory function, many participants shared their critical & unbiased feedback that was encouraging for the organizers. Conclusive remarks were given by Dr. Srikanth Rapole. The feedback from the participants highlighted that they found this experience very much enriching and helpful.





PSI NEWS LETTER

NSWCP-2024 @ BRIC-ILS, Bhubaneswar



National Symposium and Workshop on Clinical Proteomics (NSWCP-2024) August 20-23, 2024



Convener: Dr. Amol R. Suryawanshi

BRIC-Institute of Life Sciences (ILS), Bhubaneswar has successfully conducted "National Symposium and Workshop on clinical proteomics" (NSWCP-2024) at ILS, Bhubaneswar from Aug 20-23, 2024. This was included one day Symposium on Tuesday, August 20, 2024 followed by workshop on August 21-23, 2024. This event was supported by DBT-SAHAJ program, Proteomics Society, India (PSI) and Thermo Fisher Scientific, India

OBRIC S

This program was inaugurated with lightening of lamp by Dr. Shantanu Sengupta, President, PSI followed by welcome address by Dr. Amol Suryawanshi, Convener, NSWCP-2024. During this Symposium, many experts on the field of clinical proteomics namely Dr. Srikanth Rapole, Dr. Tushar Maiti, Dr. Ranjan Nanda, Dr. Amol Suryawanshi, Dr. Shantanu Sengupta, Dr. Sanjeeva Shrivastava, Dr. Amit Kumar Yadav, Dr. Venkatesh Chanukuppa and others experts have delivered the talks on clinical proteomics and its applications.

In this symposium, more than 75 delegates including faculties and research scholars from medical colleges such as AIIMS, KIMS, SUM hospital, VIMSAR, Burla etc., universities such as Utkal, Ramadevi, KIIT, FM, NOU, SOA etc., and research institutes such as NISER, IISER, RMRC, RPRC, CIFA etc. had actively participated. Symposium was concluded with remarks by session chairs followed by vote of thanks by Dr. Soma Chattopadhyay, Co-convenor of NSWCP-2024.



G2



NSWCP-2024 @ BRIC-ILS, Bhubaneswar

The workshop was started on August 21, 2024 with introduction of participants those were selected for this hand-on workshop on clinical proteomics from all over the India. During workshop, Dr. Srikanth Rapole talked on Basics of Mass Spectrometry and its applications, Dr. Venkatesh Chanukuppa elaborated about the overview on Basics of Orbitrap Technology, and proteomic approaches, Dr. Amol Suryawanshi explained about quantitative proteomics and Dr. Amit Kumar Yadav provided special talk on "Basics of Database search and false discovery rate for MS Data analysis"

Hand-on training conducted on Quantitative proteomics for clinical Applications which classified in three major module. On day 1, module 1 was covered which includes sample preparation from various clinical samples (serum/tissue/cells) along with practices and precautions. On day 2, module 2 on data acquisition for Qualitative, label and label free Quantitative (LFQ) analysis using High Resolution Mass Spectrometer (HRMS) was performed. This module was included Hand-on training on Instrument handling and calibration of the HRMS (Orbitrap Fusion Lumos Mass Spectrometer with Vanquish Neo Nano-LC) etc. Last day, module 3 with Data visualization, analysis and interpretation was performed. This was included with Hand-on training and Demonstration on the Proteome discoverer (PD) software, Qualitative and Quantitative Data visualization, analysis and exporting using PD, LFQ analysis and statistical analysis for the identified and quantified proteins, TMT or ITRAQ label data analysis using Proteome Discoverer software etc. Each day was concluded with the interaction of Dr. Amol Suryawanshi with participants along with question & answer session, discussion on utility of this training for participants research work etc.

This workshop on concluded on August 23, 2024 with valedictory function. In this Dr. Amol Suryawanshi provided complete overview of this workshop followed by feedback from participants and distribution of certificates to them. Concluding address was delivered by Dr. Debasis Dash, Director, ILS followed by vote of thanks by Dr. Soma Chattopadhyay, Co-convenor of NSWCP-2024.





Metabolomics Workshop @ Yenepoya, Mangalore



YENEPOYA RESEARCH CENTRE





"Workshop on Metabolomics" On September 3-5, 2024 at Yenepoya (Deemed to be University), Mangalore Convener: Prof. Keshav Prasad

A total of 68 participants, including students, research fellows, and faculty members, attended the workshop and the workshop conducted in both online and offline mode. These participants had the opportunity to engage with experts in the field, discuss their research, and receive personalized guidance on their projects. The interactive nature of the workshop fostered a collaborative learning environment, encouraging knowledge exchange and networking among attendees. At the workshop, there was a guest talk on the "cardiovascular disease in India and the establishment of CSIR longitudinal Cohort". Distinguished speaker Dr. Shantanu Sengupta, CSIR-Institute of Genomics and Integrative Biology, New Delhi spoke at the workshop.

On day one sessions, experts / speakers covered various aspects of metabolomics in their talk such as Introduction to Metabolomics by Dr. T. S. Keshava Prasad; Basics of Chromatography/ HPLC by Dr. Akhila H S; Basics of MS-Based Metabolomics by Dr. Prashant Modi; Sample Preparation Strategies by Mr. Shubham. This was followed by Hands on session / Demonstrations on Sample Preparation and Basics of LC-MS/MS by Ms. Sophia, Ms. Nikhitha, Dr. Neha, Mr. Shubham and Ms. Vineetha.

The second day highlight includes session on Sample Loading and Data Acquisition by Dr. Neha and Ms. Nidhi; Introduction to Metabolomics Data Analysis by Ms. Susmi; Data Analysis of Untargeted Metabolomics by Dr. Akhila and Ms. Vanya; followed by Hands-on Data Analysis of Untargeted Metabolomics by Dr. Shivleela, Ms. Vineetha, and Ms. Susmi.





Metabolomics Workshop @ Yenepoya, Mangalore

The day three highlights includes talk on Metabolic Pathways and Biological Interpretation of Metabolomics by Prof. Dr. Keshava Prasad; then Targeted Metabolomics by Mr. Shubham followed by Demonstration on Targeted Metabolomics Analysis by Mr. Shubham and Ms. Neha S. and Data Analysis Using MetaboAnalyst by Dr. Jonny, Dr. Shivaleela, and Ms. Susmi.



Overall, the Workshop on Metabolomics was a significant educational initiative that equipped participants with the skills and knowledge necessary to advance their research in metabolomics. The comprehensive curriculum and expert-led sessions ensured that attendees left with a solid foundation in mass spectrometry-based metabolomics and a keen understanding of its applications in various scientific domains.











INVITATION Proteomics Society, India



Yenepoya (Deemed to be University), Mangaluru & Proteomics Society, India

-0-

17th Annual Meeting of Proteomics Society, India and International Conference On PROTEOMICS BEYOND BOUNDARIES: INTEGRATING OMICS FOR INNOVATION : TO NURTURE HUMAN, ANIMAL, PLANT AND ENVIRONMENTAL HEALTH

Tentative Dates: 20th to 22nd November, 2025 Center for Systems Biology and Molecular Medicine [An ICMR-Collaborating Centre of Excellence 2024-2029] Yenepoya Research Centre,

Yenepoya (Deemed to be University), Mangaluru 575018, India < team_csbmm@yenepoya.edu.in () www.yenepoya.edu.in / www.csbmm.yenepoya.res.in

ITATION

14

4D Omics @ IIT Bombay, Mumbai

"Pioneering the Future of Healthcare and Diagnostics Using 4D Omics" On November 12, 2024 at IIT Bombay, Mumbai Convener: Prof. Sanjeeva Srivastava

IIT Bombay hosted a landmark symposium, Pioneering the Future of Healthcare and Diagnostics Using 4D Omics, organized by the Proteomics Lab, Department of Biosciences and Bioengineering. The symposium was a grand confluence of academic, clinical, and industrial leaders, exploring transformative advancements in 4D proteomics and multi-omics technologies with the goal of revolutionizing healthcare diagnostics and therapeutics. This symposium was focused on Cancer Diagnostics: Leveraging 4D Omics to unravel cancer progression and improve therapeutic strategies, Maternal and Child Health: Omics-driven interventions for better health outcomes and Preventive Health: Integrating temporal molecular data for personalized health monitoring.

Plenary Sessions and Keynotes: The day commenced with an inspiring convener's address by Prof. Sanjeeva Srivastava, setting the tone for the proceedings. The symposium featured several distinguished keynote speakers, including: **Dr. Balram Bhargava** (AIIMS, New Delhi, and former Director General of ICMR), who delivered a plenary talk on "India's Leadership in COVID-19: Shaping the Future of Global Healthcare." and **Dr. Sewanti Limaye** (Director Medical & Precision Oncology, Sir H.N. Reliance Foundation Hospital), who spoke on "Precision Oncology: The Silver Lining to Cancer Care."

Technological Launch: The event was marked by the inauguration of India's first timsTOF 4D-Proteomics technology, paired with EvoSep chromatography, at Proteomica International Pvt Ltd., a start-up incubated at SINE, IIT Bombay. This launch, led by Prof. Srivastava and Dr. Arghya Banerjee, showcased India's entry into state-of-the-art 4Dproteomics innovation.



BREAKING NEWS









4D Omics @ IIT Bombay, Mumbai

The symposium was structured into multiple thematic sessions, each focusing on critical aspects of healthcare and diagnostics:

1. Omics in Healthcare - Pioneering Innovations: Keynote by Dr. Malini Laloraya (Rajiv Gandhi Centre for Biotechnology): "Revolutionizing Reproductive Health: Omics Approaches in Female Metabolism."; Dr. Harpreet Singh (ICMR): "Digital Health for Next-generation Healthcare in India."; Dr. Deepak Kumar Saini (IISc, Bangalore): "Longevity India Initiative: The Role of Omics in Aging Research."

2. Omics and Healthcare - Clinical and Industrial Perspectives: Two panel discussions moderated by Dr. Barnali Das (Kokilaben Hospital) and Dr. Prashant Kumar (CSO, Datar Cancer Genetics) explored breakthroughs in clinical omics and collaborative innovation between academia and industry.

3. Roadmap for India's Healthcare: Keynote by Prof. Srivastava: "Clinical Proteomics & Multi-omics: Current Landscape, Challenges, and Future Prospects." and Plenary by Dr. Balram Bhargava, focusing on India's achievements in healthcare leadership.

4. 4D-Omics in Action: Hands-on demonstrations and talks by experts like Dr. Srikanth Rapole (NCCS, Pune), Dr. Mahesh Kulkarni (NCL, Pune), Dr. Amol Suryawanshi (ILS, Bhubaneswar), Dr. Suman Thakur (CCMB, Hyderabad) and Dr. Jaran Jainhuknan (Bruker, Thailand) provided insights into advanced proteomics applications.

5. High-throughput Proteomics and Data Science: Interactive quiz sessions tested participants' knowledge of omics technologies. And Talks on AI/ML integration in proteomics by Dr. Deeptarup Biswas (Harvard Medical School).

Cultural and Networking Activities: The symposium also celebrated Indian tradition with a cultural performance by Dr. Tushar Guha's Nrityanjali Group, followed by a felicitation ceremony honouring women scientists and SIP-2024 award winners. Participants toured the state-of-the-art proteomics facility for a deeper understanding of cutting-edge research tools.

Conclusion: The symposium underscored the significance of 4D Omics with temporal insights to transform disease understanding and personalized medicine. Through its stellar line up of speakers, workshops, and demonstrations, the event provided a collaborative platform for academia, industry, and clinicians, advancing healthcare innovation.







Nano-proteomics workshop @ Delhi University, Delhi

"Nano-proteomics workshop: Training workforce for sustainable and stress-resilient crop production" On 24th - 30th December 2024 at Dept. of Botany, University of Delhi, Delhi Convener: Prof. Renu Deswal

A seven-day workshop was organized by Prof. Renu Deswal, Department of Botany, University of Delhi under the umbrella of **Delhi University Botanical Society**. This workshop was conceptualized as biology works on the Nanoscale. Moreover, there is absolutely no information regarding nano-bio interactions. The inaugural lecture "**Insights into plant seed proteome**", was delivered by Dr. Dinakar M. Salunke (Emeritus scientist and former Director, of the International Centre for Genetic Engineering and Biotechnology (ICGEB)). He showed in a lucid manner, "How from structures can one find the function of proteins?" The workshop was funded by the Proteomics Society of India (PSI), the Department of Biotechnology (DBT) and Industry partners including MTOR, Helix Biosciences and MERCK.

Technical session I: Chemical and Green Synthesis of AuNPs and their Characterization comprised of chemical and green synthesis of nanoparticles and characterization by LSPR using UV-visible spectroscopy, detection of functional groups using the FT-IR, and the crystallinity using XRD. The session had lectures by Dr. Kalpana Bhargava, High Energy Material Research Lab, Pune and Prof. Mahima Kaushik, Nano-Bioconjugate Chemistry Lab, Cluster Innovation Centre, University of Delhi. Their lectures provided knowledge regarding the chemical and green synthesis of nanoparticles and their application for enhanced crop production.

Session II : Formation of Nanoparticle- Protein corona complex. The session had lectures by Prof. Niranjan Chakraborty, Professor of Eminence, National Institute of Plant Genome Research, New Delhi, who described the history and basics of proteomics and also showed how to discover the function of unknown proteins "Proteome Dynamics and defence Response: from Mitochondria to Sustainable Agriculture". Dr. Pratima R. Solanki, Special Centre for Nanoscience, Jawaharlal Nehru University spoke on "Green-Synthesized Carbon Quantum Dots: Advances in Sensor Development and Bio-conjugation Applications". Prof. Prashant Mishra, Biochemical Engineering and Biotechnology, Indian Institute of Technology Delhi, New Delhi insightful lecture on "Next-generation biosensor and protein-based nanoelectronics" provided knowledge regarding biosensors and the role of protein-based nanoelectronics in proteomics. The hands-on session included the isolation of Brassica juncea extract and incubation with nanoparticles for corona formation. The principle and working of FE-SEM and DLS Zeta sizer nano were demonstrated at the University Science Instrumentation Centre, University of Delhi.











PSI NEWS LETTER

Nano-proteomics workshop @ Delhi University, Delhi

Session III: Isolation of Nanoparticle - protein corona complex and differential polypeptide analysis by SDS PAGE. The session had lectures by Dr. S. Kiran Ambatipudi, Department of Biosciences and Bioengineering, IIT, Roorkee who delivered a talk on "Bovine Milk: An Indicator of Health, Disease, and Beyond" with insightful information regarding the relationship between milk and health diagnostics and our understanding that milk is not just milk. The hands-on session by Dr. Ravi Gupta, Kookmin University, South Korea involved Post-Mass spectrometry analysis: MAXQUANT, Metabo-analyst, UNIPROT and other bioinformatics tools to analyse proteomics data. The hands-on session also included resolving and visualizing the corona-nanoparticle complexes.

Session IV: Mass Spectrometry. The session had lectures by Dr. Subhra Chakraborty, Ex Director, National Institute of Plant Genome Research, New Delhi lectured on "Unfolding the secrets of seed nutrient dynamics using integrative omics towards quality traits and nutritional security". The lecture provided a deeper insight into seed nutrient dynamics using integrative omics toward quality traits and nutritional security. Dr. Amit Yadav, BRIC-Translational Health Science and Technology Institute, Faridabad delivered a lecture on "Proteomics Database Searching for Identifying Proteoforms and Post-Translational Modifications" which provided knowledge about identifying proteoforms. Mr. Prasad Bidwe, Senior Sales and Product Specialist-Asia Pacific Region, Merck Life Sciences, India delivered an insightful lecture on "Bridging AI and Chemistry: Cutting-Edge Tools for Drug Design and Synthesis". The hands-on session included in-gel and in-solution trypsin digestion for mass spectrometry, and enzymatic validation of carbonic anhydrase identified in protein corona complexes.

Session V: Immunoblotting for validating the corona-bound RuBisCO by Western blotting. The session had lectures by Dr. Niroj Kumar Sethy on "Metabolomics as a tool to understand nano-bio interactions". He detailed the basics of metabolomics. Dr. Ajaswrata Dutta spoke on "Integrated quantitative proteomics and data mining approaches for identification of radiation-induced gastrointestinal injury biomarkers". Dr. P. S. Vijaya Kumar delivered a lecture on "Sensors for plant stress" providing insights on the nanoparticle-based sensors for volatile detection for plant stress detection. The hands-on session was on the immunodetection of Rubisco protein in hard and soft corona of protein corona complexes.

Session VI: Understanding the Physiological and Biochemical Impact of NP-PC in Plants had lectures by Prof. Hari Prasad G., AIIMS Delhi, New Delhi who spoke on "Clinical proteomics as a platform for precision medicine". His lectured on early disease detection and the role of proteomics in real-time monitoring. Dr. Rashmi Rana, Sri Ganga Ram Hospital, New Delhi lectured on "Exploring a hybrid platform, Exo-Omics: Integration of Nanocarriers with Multi-Omics for efficient drug delivery in cancer". Her work integrated multi-omics with nanotechnology, offering promising avenues to revolutionize cancer treatment strategies. Dr. Gagan Deep Jhingan's, (V-Proteomics) detailed lecture on "Mass Spectrometry based application of Phospho-proteomics technology to understand dynamics of signalling pathways".

The valedictory session was chaired by Prof. Dinabandu Sahoo, Dept. of Botany, University of Delhi. Mr. Ankit Rana, Head: Academic Initiatives, Life Sciences Sector Skill Development Council (LSSSDC) highlighted the gap that exists in reallife problems and research being conducted and also the gap in industry and academia. He detailed the programs of skill development ministry to develop a skilled workforce. The valedictory lecture delivered by Dr. Suphiya Khan, Shriram Institute for Industrial Research, Gurugram was the icing on the cake. She showed a seamless blend of science and entrepreneurship. Her journey reminded the participants that when the research is coupled with a vision for societal impact it can revolutionize industries and lives.



Upcoming events









INVITATION

Proteomics Society, India

Yenepoya (Deemed to be University), Mangaluru & Proteomics Society, India

17th Annual Meeting of Proteomics Society, India and International Conference On

PROTEOMICS BEYOND BOUNDARIES: INTEGRATING OMICS FOR INNOVATION : TO NURTURE HUMAN, ANIMAL, PLANT AND ENVIRONMENTAL HEALTH

Tentative Dates: 20th to 22nd November, 2025 Center for Systems Biology and Molecular Medicine [An ICMR-Collaborating Centre of Excellence 2024-2029] Yenepoya Research Centre, Yenepoya (Deemed to be University), Mangaluru 575018, India

🔀 team_csbmm@yenepoya.edu.in @www.yenepoya.edu.in / www.csbmm.yenepoya.res.in 🔒





Advances in Proteomics Technologies - 2025 International Conference and Workshops Venue: IIT Bombay, Mumbai Convener: Prof. Sanjeeva Srivastava







Across

4. (last name) and team performed the first single cell proteomics analysis in Xenopus laevis egg in 2014.

6. (last name) and his team reported the MRM mass spectrometry technique in 1978.

8. (last name) developed NMR methods to map the 3D structure of proteins in mid 1980s.

9. coined the term 'proteomics' in 1996.

11. Synder and his team developed the first Chip for Analysis of Proteins in 2001.

14. Modern techniques of mass spectrometry were devised by (last name) and Aston in 1918 and 1919 respectively.

16. (last name) from University of Pennsylvania developed the first TOF-MS in 1946.

18. The first mass spectrometer constructed in 1912 by J. J. Thomson was originally called a

20. (last name) and his student developed the quadrupole mass analyzer and the 3D quadrupole ion trap in 1953.

21. In 1952, determined the amino acid sequence of insulin.

23. The term was coined by Marc Wilkins in 1994.

24. is a next-generation protein sequencing platform that was launched by Quantum-Si in 2022.

25. (last name) and his team developed the protein in-gel digestion method for internal sequence analysis in 1992.

26. John B. Fenn and developed methods for mass spectrometric analysis of biological macromolecules in the 1980s.
28. The electrospray ionization technique was first reported by Masamichi Yamashita and in 1984.

29. University also founded the first dedicated proteomics laboratory in 1995.

Down

Edman degradation protein sequencing method was discovered by (full name) in 1950
 (last name) and Thomson were the first to use mass spectrometry (1897 – 1898).

5. PTMs are a diverse group of modifications to the protein that can be naturally derived.

12. In 2024, chemistry Nobel was awarded for developing a AI tool for predicting protein structures called

13. is abbreviation of Swedish-based program launched in 2003 to map all the human proteins in cells

15. is an alternative to DDA where a fixed number of precursor ions are selected and analyzed by tandem mass spectrometry.

17. Akoya Biosciences is credited with developing the spatial proteomics method that won the 2024 Nature Methods award.

18. (last name) and Kendrew received the Nobel Prize in Chemistry in 1962 for their major achievement of successfully using X-ray crystallography.

19. A is a defined form of a protein from a given gene with a specific amino acid sequence and localized PTMs.

22. (last name) and Waggoner invented 2D DIGE in 1997.

27. was abbreviation of program launched by HUPO in 2011 to Map the entire human proteome.

Information about PSI



Proteomics Society, India Registered under Andhra Pradesh Societies Registration Act. (35/2001) (Regd. No. 286/2009)

The Proteomics Society, India, established in 2009, serves as a vibrant community of proteomics researchers dedicated to fostering knowledge exchange, collaboration, advancing proteomics research by disseminating cutting-edge information, facilitating networking opportunities, offering specialized promoting training, and scientific developments to nurture a robust proteomics culture across India. The Society which is strongly dedicated to education for research in Proteomics.



Join Us

For PSI Membership

<u>https://proteomicssocie</u> <u>ty.in/MemberShip.aspx</u>

Journal of Proteins and Proteomics



JPP administered by Proteomics Society of India (PSI), is a peer reviewed international journal published by Springer Nature



(https://link.springer.com/journal/42485)

Location

CSIR - Centre for Cellular & Molecular Biology (CCMB), Uppal Road, Habsiguda, Hyderabad - 500 007 Telangana, INDIA.

Contact us

Phone– +91 40 2719 2632 Email– <u>proteomicsociety@ccmb.res.in</u> Website– <u>www.proteomicssociety.in</u>