Advanced Clinical Proteomics - Web course

COURSE OUTLINE

Genomics to Proteomics, Basics of Amino acids and Proteins, Proteins to Proteomics, Sample Preparation for Proteomic Analysis. Gel based Proteomics, Difference In Gel Electrophoresis for Quantitation of Protein Expression, Gel based Proteomic Data Analysis, 2D DIGE Clinical Applications, Protein Digestion. High Performance Liquid Chromatography Mass Spectrometry, Hybrid MS Configurations, Tandem Mass Spectrometry for Protein Identification, Peptide Mass Fingerprinting, *In vitro* Quantitative Proteomics using iTRAQ, iTRAQ Clinical Applications, *I n vivo* Quantitative Proteomics using SILAC, SILAC Clinical Applications, isotope Coded Affinity Tagging (ICAT), MS for PTM analysis. Interactomics: Techniques to Study Protein Protein Interactions, Antigen and Antibody Microarrays, Reversed Phase Protein Microarrays, Cell free Expression Based Protein Microarrays, Nucleic Acid Programmable Protein Arrays, Microarrays for Autoantibody Profiling, Microarrays for PTM Analysis. Label free Proteomics, Surface Plasmon Resonance, Surface Plasmon Resonance Imaging, Protein Interaction Analysis using SPR and SPRi, Nanotechnologies in Proteomics. Challenges in Clinical Proteomics, Serum Proteomics, Urine Proteomics, Salivary Proteomics, Bioinformatics and Proteomics, Proteomics for Translational Research, Future of Proteomic Technologies for Clinical Applications.

COURSE DETAIL

Modules	Topic/s	No of Lectures
1	Genomics to Proteomics, Basics of Amino acids and Proteins, Proteins to Proteomics, Sample Preparation for Proteomic Analysis.	4
2	Gel-based Proteomics, Difference In -Gel Electrophoresis for Quantitation of Protein Expression, Gel-based	5

NPTEL

http://nptel.iitm.ac.in

Biotechnology

Pre-requisites:

- Basic biochemistry

Additional Reading:

Proteomics in Practice: A Guide to Successful Experimental Design, 2nd Edition by Reiner Westermeier, Tom Naven, Publisher: Wiley

Coordinators:

Prof. Sanjeeva Srivastava
School of Biosciences and BioengineeringIIT Bombay

	Proteomic Data Analysis, 2D-DIGE Clinical Applications, Protein Digestion.	
3	High Performance Liquid Chromatography Mass Spectrometry, Hybrid MS Configurations, Tandem Mass Spectrometry for Protein Identification, Peptide Mass Fingerprinting, In vitro Quantitative Proteomics using iTRAQ, iTRAQ Clinical Applications, In vivo Quantitative Proteomics using SILAC, SILAC Clinical Applications, isotope -Coded Affinity Tagging (ICAT), MS for PTM analysis.	11
4	Interactomics: Techniques to Study Protein-Protein Interactions, Antigen and Antibody Microarrays, Reversed -Phase Protein Microarrays, Cell-free Expression Based Protein Microarrays, Nucleic Acid Programmable Protein Arrays, Microarrays for Autoantibody Profiling, Microarrays for PTM Analysis.	7
5	Label-free Proteomics, Surface Plasmon Resonance, Surface Plasmon Resonance Imaging, Protein Interaction Analysis using SPR and SPRi, Nanotechnologies in Proteomics**.**	5
6	Challenges in Clinical Proteomics, Serum Proteomics, Urine Proteomics, Salivary Proteomics, Bioinformatics and Proteomics, Proteomics for Translational Research, Future of Proteomic Technologies for Clinical Applications.	8
	Total	**40**

References:

1. Introducing Proteomics: From Concepts to Sample Separation, Mass Spectrometry and Data Analysis, Josip Lovric, Publisher:Wiley, ISBN:9780470035245

2. Biomedical Applications of Proteomics by Garry L. Corthals (Editor), Denis F. Hochstrasser (Editor), Jean-Charles Sanchez (Editor) Publisher:Wiley ISBN:9783527308071
3. Principles of Proteomics, R.M. Twyman, Bios Scientific Pub., 2004.
4. Proteomics: A Cold Spring Harbor Laboratory Course Manual, A.J. Link and J. LaBaer, Cold Spring Harbor Laboratory Press, 2009.