NOC:Proteins and Gel-Based Proteomics - Video course

COURSE OUTLINE

This course introduces to the basic biology of proteins and gel-based proteomics. To obtain better understanding of cellular processes & regulation, there has been an increasing interest in studying proteomics. Proteomics techniques aim to look into the protein properties from a global perspective, i.e., not undertaking one protein at a time, but an entire set of proteins in the milieu. These proteomic techniques typically aim to elucidate the expression, interaction, and cellular function of proteins.

The course will provide the basic understanding of amino acids and proteins. It would also provide detailed information on gel-based proteomic techniques such as SDS-PAGE and 2-DE. Some of the limitation of 2-DE has been overcome by advanced Difference gel electrophoresis (DIGE) technique, which will be discussed in this course. Protein identification using MALDI-TOF/TOF mass spectrometry will also be discussed. 2-DE in combination with mass spectrometry has become very powerful tool for proteomics applications and students can learn these tools by attending this course.

COURSE DETAIL

Week No.	Topics
1.	**Basics of amino acids and proteins** L1. Introduction to amino acids L2. Introduction to proteins L3. Protein folding & misfolding L4. Protein purification techniques L5. Introduction to proteomics
2.	**Gel-based proteomics and Sample Preparation** L6. Systems biology and proteomics L7. Introduction to gel-based proteomics L8. Sample preparation for gel-based proteomics

NP-TEL

NPTEL

http://nptel.ac.in

Biotechnology

Pre-requisites:

The target audiences of this course are required to have a basic biology and biochemistry background.

Coordinators:

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	L9. Sample preparation for gel-based proteomics (contd.) L10. One-dimensional electrophoresis
3.	**Two-dimensional gel electrophoresis (2-DE)** L11. 2-DE (Rehydration & IEF) L12. 2-DE (Second dimension, staining & destaining) L13. 2-DE (Gel analysis) L14. 2-DE applications L15. 2-DE: challenges & troubleshooting
4.	**Difference gel electrophoresis (DIGE) & Mass Spectrometry** L16. 2D-DIGE: basics L17. 2D-DIGE: data analysis L18. 2D-DIGE: applications L19. MALDI-TOF/TOF: basics L20. MALDI-TOF/TOF: data analysis