

# Central University of Punjab, Bathinda

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## Department of Biochemistry and Microbial Sciences

Two Days Workshop on “**Functional Proteomics**”

### Detailed Schedule

#### Day I

**08 October, 2018**

#### **Protein purification, profiling and separation**

- 8.30 onwards: Registration, Gate near Seminar Hall
- 9:15-9:20 AM Welcome and brief note about the workshop
- 9:20 -9:30 AM Keynote Address
- 9:30-10.30 AM: Lecture I: **Introduction to Automated Protein Purification system**
- 10:30-11:00 AM Tea
- 11:00 AM-1:30 PM Lecture II: **Designing Protein Purification Strategy**
- 1:30 -2:30 PM Lunch break
- 2:30 -5:30 PM Lecture III and Lab: **Purification of Proteins using Anion Exchange Chromatography and Analysis of the Results**

#### **Techniques to be used**

##### **Fast Process Liquid Chromatography.**

AKTA is an automated FPLC (Fast Process Liquid Chromatography) system which can be used to analyze different protein components in a sample and standardize and carry out protein purification from various sources. Using AKTA systems chromatography proteins can be separated on basis of intrinsic properties such as charge, size, shape, hydrophobicity and specificity for a ligand. Many different chromatography techniques can be used in AKTA system such as ion-exchange chromatography, size-exclusion chromatography, hydrophobic interaction chromatography and reverse-phase chromatography. Choice of chromatography technique and purification strategy to be deployed depends upon the sample source, types of impurities, nature of the target protein and scale of purification.

**Venue:** Seminar Hall, Biochemistry and Microbial Sciences lab and CIL (for FPLC).

**Speaker:** Dr. Likhesh Sharma, Ph.D. Application Scientist, GE Healthcare-Life Sciences

## Day II

09 October, 2018

### Proteomic profiling, mapping and analysis using 2D Electrophoresis

9:30-10:30 AM	Lecture IV: <b>Introduction to Gel Based Proteomics Approach</b>
10:30-11:00 AM	Tea
11:00 AM-1:30 PM	Hands on training
1:30 -2:30 PM	Lunch break
2:30-3:30PM	<b>Analyzing the 2D-PAGE data and Introduction to Mass Spectroscopy</b>
3:30 -4:00 PM	Valedictory function and vote of thanks
4:00 PM onwards	Tea and Wrap-up

#### Techniques to be used:

1. Sample preparation for 2D gel electrophoresis
2. Isoelectric Focusing (IEF)
3. 2D gel electrophoresis
4. Scanning of gel and analysis of 2D images.

Two-Dimensional Electrophoresis (2DE) is an integral tool in the study of proteomics and is often described as the proteomics "workhorse". 2DE enables the separation of complex protein mixtures by combining isoelectric focusing (IEF) in the first dimension and SDS-PAGE in the second dimension. Isoelectric focusing is a sophisticated and reproducible technique where proteins are separated based on their isoelectric point; SDS-PAGE separates proteins based on the size. Using analysis software, the expression pattern of various proteins and their comparison across different groups can be analysed. The sequence of analysed proteins excised from gel spots can be identified using mass spectrometry.

**Venue:** Seminar Hall, Biochemistry and Microbial Sciences and Animal Sciences laboratories (for 2DE).

**Speaker:** Dr. Likhesh Sharma, Ph.D. Application Scientist, GE Healthcare-Life Sciences