INTRODUCTION TO PROTEOMICS

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INTENDED AUDIENCE : B.Sc., M.Sc. and MS
PRE-REQUISITES : Any B.Sc. or M.Sc. The target audiences of this course are required to have a basic introduction to biology.

COURSE OUTLINE:
This course introduces to the basic biology of proteins and the new advanced science called as proteomics which aims 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. The course will cover in detail the two major aspects of proteomics i.e., Gel-based proteomics and Mass spectrometry-based proteomics. The gel-based module will cover different techniques like SDS-PAGE, 2-DE, 2D-DIGE etc. These techniques had a major contribution in transition from protein chemistry to proteomics. Mass spectrometry, on the other hand, is an advanced analytical technique for accurate mass measurement. In this module, we will discuss the basics of mass spectrometry, sample preparations, liquid chromatography, hybrid mass spectrometers and quantitative proteomics techniques such as iTRAQ, SILAC and TMT using mass spectrometry. The course will also provide the basic knowledge about sample preparation, mass spectrometry workflow, different chromatography technologies and quantitative proteomics.

ABOUT INSTRUCTOR:
Dr. Sanjeeva Srivastava is the Group Leader for the Proteomics Laboratory at the Indian Institute of Technology Bombay India (IITB). He obtained his Ph.D. from the University of Alberta and post-doc from the Harvard Medical School in the area of proteomics, stress physiology and has specialized expertise in applications of data enabled sciences in global health, developing country and resource limited settings.

COURSE PLAN:

Week 01 : Basics of Proteins and Proteomics
Week 02 : Gel-based proteomics
Week 03 : Two-dimensional gel electrophoresis (2-DE)
Week 04 : Difference in gel electrophoresis (DIGE) & Systems Biology
Week 05 : Basics of mass spectrometry
Week 06 : Basics of mass spectrometry and sample preparation
Week 07 : Quantitative proteomics
Week 08 : Advancement in Proteomics

TYPE OF COURSE : Rerun | Elective | UG/PG
COURSE DURATION : 8 weeks (23 Aug'21 - 15 Oct'21)
EXAM DATE : 23 Oct 2021