CNWY40160 - Applied Proteomics (Live Module Details) 2010/11

General Information

Subject Area:	**Conway Institute**	**Short Title:**	**Applied Proteomics**
Semester:	**SEM_3**	**Long Title:**	**Applied Proteomics**
Module Coordinator:	**Giuliano Elia**	**School:**	**Conway Institute**
Level:	**4**	**Credits:**	**5**
Module Status:	**Active**	**Passing Grade:**	**40%**
Available on Blackboard:	**Yes**		

Module Places

Overall Places:	**20**	**Core / Options:**	**20**	**General Elective:**	**0**
		In-Programme:	**0**	**International:**	**0**

Module Description:

This module is designed for students who wish to understand and become critically aware of principles, practice and applications of the rapidly developing proteomic technologies. It will be delivered in 10 stand-alone blocks, each one composed of 3hr seminar-style sessions (mornings) and 4hr practical sessions (afternoons), covering:

Refresher of protein biochemistry: 1 block

Gel-based and gel-free separations: 2 blocks

Mass Spectrometric techniques: 2 blocks

Post-translational modifications and Interactomics: 1 block

Protein arrays technology: 1 block

Proteomic Bioinformatics: 1 block

Validation techniques: 1 block

Clinical Applications of Proteomics: 1 block

Learning Outcomes:

On completion of the course the students should:

1. Understand protein biochemistry principles and be able to apply them to protein separation and purification.

2. Have acquired critical awareness of differences between gel-based and gel-free proteomic approaches and be able to run simple electrophoretic separations.

3. Demonstrate understanding of the distinction between resolution, accuracy, sensitivity and throughput of a mass spectrometer.

4. Formulate the principles of MALDI and ESI mass spectrometry, demonstrate knowledge of the different mass analysers and detectors and integrate this knowledge with the application of modern methods in label-assisted and label-free quantitative proteomics.

5. Demonstrate the capability to carry out a correct MALDI experiment on a tryptic digest.

6. Demonstrate knowledge and understanding of the most important post-translational modifications of proteins and of methods for their analysis.

7. Be familiar with the different techniques used to study protein-protein interactions.

8. Be aware of the different types of protein arrays, their characteristics and their applications.

9. Understand the principles of recombinant protein cloning and expression and utilise this knowledge to devise strategies for protein array production.

10. Understand the theory and practice of usage of the Protein Expression Factory.

11. Demonstrate understanding of the theory and practice of mass spectrometry data handling with some of the most common bioinformatic algorithms.

12. Be able to apply these principles to the usage of the in-house developed proteomic pipelines Prolineand Flexomics.

13. Demonstrate critical awareness of proteomic validation techniques. In particular, be familiar with the theory and applications of antibody phage display technology and demonstrate the ability to conduct SRM (selected reaction monitoring) by triple-quadrupole mass spectrometry.

14. Be able to evaluate and describe the impact of the application of proteomic anal yses to relevant biomedical and clinical set-ups.

15. Be able to critically assess the difficulties involved in investigating different clinical specimens.

Workload

Code	Workload
Autonomous Student Learning	**30**
Lectures	**30**
Specified Learning Activities	**40**
Total	**100**

Assessment Strategies

Assessment Type	Description	Timing	Score-by	% Final Grade	In-Blackboard
MCQ	**End-course evaluation session**	**UNSPECIFIED**	**Mark**	**25**	**No**
ASSIGN	**End-course evaluation session**	**UNSPECIFIED**	**Mark**	**25**	**No**
MCQ	**Mid-course evaluation session**	**UNSPECIFIED**	**Mark**	**25**	**No**
ASSIGN	**Mid-course evaluation session**	**UNSPECIFIED**	**Mark**	**25**	**No**

Prior Learning - Recommended:

It is recommended that students have completed CNWY40090 Introduction to 'Omic' & Advanced Imaging Technologies prior to registering for this module.

Resits

Type	Duration - Hours	Timing Weeks
CW		