



Module Descriptor for CNWY40160 in 2014

Printed on 25 April 2014

by Elaine Quinn

Conway Institute of Biomolecular & Biomedical Research

Short Title	Long Title
Applied Proteomics	Applied Proteomics

Level	Credits	Semester	Passing Grade	Available on Blackboard ?	Module Coordinator	Status	Last Modified
4	5.0	Semester Three	40 %	Yes	Matthias Wilm	Continuing Module	20 Jun 2013

Total Places	Core /Option	In Prog	Gen Electives	Intl Places
20	20	0	0	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 analyses to relevant biomedical and clinical set-ups. 15. Be able to critically assess the difficulties involved in investigating different clinical specimens.

Workload

Type	Hours
Autonomous Student Learning	50
Lectures	30
Specified Learning Activities	40
Total	120

Assessment Details

Description	Timing	Score By	% Final Grade	In Blackboard ?
End-course evaluation session	Unspecified	MRK	40	N
Mid-course evaluation session	Unspecified	MRK	40	N
Requirement of 70% attendance	Unspecified	MRK	20	N
Total			100	

Prior Learning

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



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Module Resits

Resit Type	Duration - Hours	Timing Weeks
In-semester assessment		

Module Remediation Strategies

Remediation
If you fail this module you may repeat, resit or substitute where permissible

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