

**CNWY 40090: INTRODUCTION TO 'OMIC' AND ADVANCED IMAGING
TECHNOLOGIES 2008/2009**

Module Co-ordinator: Dr C O'Connor

Credits: 5

**Monday morning sessions. Conway Lecture Theatre &
Conway Computer Lab (Sessions 3&4)**

Date & Time	Session & Topic	Co-ordinator
February 16th 2009 L1 09.30 – 10.30 L2 11.30 – 11.30 L3 11.30 – 12.30	Proteomics Session 1 <i>To cover:</i> <ul style="list-style-type: none"> • An overview of Proteomics methods • Mass spectrometry of proteins and peptides • The impact of quantitative proteomics in biology 	D Cahill / M. Dunn
February 23rd 09 L1 09.30 – 10.30 L2 11.30 – 11.30 L3 11.30 – 12.30	Proteomics Session 2 <i>To cover:</i> <ul style="list-style-type: none"> • Biomedical applications of proteomics • Applied proteomics for the study of disease – brain and heart • Generation and applications of protein and antibody arrays 	D Cahill / M. Dunn
March 2nd 09 L1 09.30 – 10.45 L2 11.00 – 12.30	Bioinformatics Session 1 <i>To cover:</i> <ul style="list-style-type: none"> • What is Bioinformatics? • The uses and misuses of Bioinformatics • Sequence formats, databases and associated query tools 	P. O'Gaora
March 9th 09 L1 09.30 – 10.45 L2 11.00 – 12.30	Bioinformatics Session 2 <i>To cover:</i> <ul style="list-style-type: none"> • Complete genome projects and resources • Accessing complete genome data • Homology searching and multiple sequence alignment 	P. O'Gaora
March 23rd 09 L1 09.30 – 10.45 L2 11.00 – 12.30	Genomics & Transcriptomics Session 1 <i>To cover:</i> Genomics – <ul style="list-style-type: none"> • General understanding of the principals of Genomics • Constructing Genome maps • Genome Sequencing • Genomic Variation Transcriptomics – <ul style="list-style-type: none"> • General understanding of Transcriptomics • Regulation of the transcriptome • Microarray Technology (its advantages and disadvantages) 	S. Ennis / J O'Sullivan
March 30th 09 L1 09.30 – 10.45 L2 11.00 – 12.30	Genomics & Transcriptomics Session 2 <i>To cover:</i> Genomics – <ul style="list-style-type: none"> • Application of Genome maps to Trait / disease identification • Genetic / Genomic disease diagnostics and personalised Medicine • Emerging technological advances and Bioinformatics in Genomics Transcriptomics – <ul style="list-style-type: none"> • Bioinformatics and Software for Microarray data analysis • Microarray Data Sharing in Life Science • Transcriptome profiling in diagnostics and pharmacogenomics and its challenges for the future 	S. Ennis / J O'Sullivan
April 6th 09 L1 09.30 – 10.45 L2 11.00 – 12.30	Advanced Imaging Technologies Session 1 - History of Imaging Technologies and Basic Principles <i>To cover:</i> <ul style="list-style-type: none"> • Brief history of imaging including significant advances in the past decade and the importance of imaging technologies to research. 	O. Belton

	<ul style="list-style-type: none"> • Basic principles of imaging methodologies and current technologies 	
April 20th 09 L1 09.30 – 10.45 L2 11.00 – 12.30	Advanced Imaging Technologies Session 2 – <i>In vitro</i> Imaging <i>To cover:</i> <ul style="list-style-type: none"> • Introduction to the specific detection of genes, proteins and organelles using immunohistochemistry, immunofluorescence microscopy and immunoelectron microscopy. • Focus on specific technologies – applications of confocal microscopy and electron microscopy to the imaging of <i>in vitro</i> model systems. 	O. Belton David Cottell
April 27th 09 L1 09.30 – 10.45 L2 11.00 – 12.30	Advanced Imaging Technologies Session 3 - <i>In vivo</i> Imaging <i>To cover:</i> <ul style="list-style-type: none"> • <i>In vivo</i> imaging of molecules, organs and systems. Applications of intravital microscopy and microscopic optical imaging (light and fluorescence) and <i>in vivo</i> molecular imaging. • Emerging technologies for whole organism imaging in two different model systems. 	O. Belton
May 4th 09 L1 09.30 – 10.45 L2 11.00 – 12.30	Advanced Imaging Technologies Session 4 <i>To cover</i> <ul style="list-style-type: none"> • Principles and applications of the major diagnostic imaging technologies used in medical practice, including CT, MRI and PET scanning 	K. Curran