2005/06 Taught Postgraduate Module Catalogue

BIOL5212M
Bioimaging
10 credits

Module manager Dr Michelle Peckham
Email: m.peckham@leeds.ac.uk

Taught Semester 2 View Timetable

Year running 2005/06

Pre-requisite qualifications
BSc in Biological Sciences and knowledge of animal cell biology or pre-requisite modules.

Pre-requisites
BIOL5215M or BIOL5235M.

This module is not approved as an Elective

Objectives
On completion of this module, students should be able to:

Understand the principles of phase, DIC, fluorescence, deconvolution and confocal microscopy, calcium imaging, and transmission and scanning electron microscopy.
Be able to perform the techniques required to obtain epifluorescence, confocal and deconvolution images of fluorescently stained fixed cells.
Understand how to transfect cells with GFP-fusion protein expression constructs, and subsequently analyse the behaviour of the expressed protein in live cells by techniques such as time-lapse fluorescence microscopy and FRAP.
Understand the principles of the techniques FRET, FLIM and TIRF microscopy..
Learn the principles of calcium imaging in live cells.
Learn the principles of imaging cells, and single molecules in the electron microscope.

Syllabus
Bio-imaging encompasses a wide range of approaches from imaging single molecules in the electron microscope, to determining the localisation of proteins in fixed cells by fluorescence microscopy. Any one, or a combination of techniques can build up a picture of the structure and function of a protein of interest and its biological role in the cell. The aim of this module is to provide an introduction to the wide range of approaches used in Bio-imaging and their relative advantages and disadvantages for analysing protein and

cellular function. The module will include a range of lectures/seminars on the techniques/approaches involved together with practical demonstrations and practical work to enable the student to obtain hands on experience of some of the techniques. The practical work will be based on visualising the cellular cytoskeleton (actin, intermediate filaments and microtubules) and molecular motors (myosin, kinesin).

Teaching methods
Tutorials: 2 x 1 hour, 6 x 2 hours;
Practical classes: 2 x 2 hours and 4 x 3 hours.

Private study
3 hours reading for each 2 hour tutorial: 18 hours;
2 hours reading for each 1 hour tutorial: 4 hours;
Preparation of 2 x 1000 word essays: 22 hours;
Reading for practical work, and preparation of practical report: 26 hours.

Progress monitoring
2 x 1000 word essays.

Methods of assessment
2 x 1000 word essays: 40%;
Laboratory practical report: 50%;
Lab book: 10%.

Reading list
The reading list is available from the Library website