The University Of Sheffield.

Department of Molecular Biology & Biotechnology

MBB6011 LABORATORY TECHNIQUES IN MOLECULAR BIOSCIENCE

Aims and Objectives 2019-20

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MBB6011 is a 30-credit module, taught in Semesters 1

Module Aims

The aim of the module is to give students practical experience in a range of essential laboratory techniques used in molecular bioscience. In addition students will also gain valuable experience in scientific writing, so that the students can confidently progress to the research project.

Content

This module will provide training and practical experience in key molecular biology laboratory techniques, including those required for gene cloning, protein over-expression and protein purification. Scientific writing skills are developed via written assignments and appropriate feedback.

Objectives

By the end of the module, a student will be able to competently carry out, and demonstrate understanding of, a range of essential techniques in molecular bioscience, including:

- Growth and maintenance of *E. coli*
- Plasmid transformation
- Plasmid DNA minipreps
- Restriction digestion
- Agarose gel electrophoresis and gel documentation
- Extraction of genomic DNA

- DNA quantitation
- PCR followed by agarose gel electrophoresis
- DNA cloning - ligation of DNA into a plasmid and transformation of *E.coli*, selection of colonies and culture of transformants, preparation of plasmid DNA, restriction digestion, gel documentation and interpretation of the results
- Growth and maintenance of yeast *S. cerevisiae*
- Yeast transformation
- Protein work - Yeast cell growth, cell harvesting, cell lysis, followed by SDS PAGE, gel documentation and interpretation of results. Western blotting for the confirmation of protein/s.

By the end of the module, a student will understand the criteria and style required to produce an acceptable piece of scientific writing. Students will have received feedback on their scientific writing skills to improve this important skill.

Teaching Method

The course will be delivered through a series of laboratory sessions, to develop the student's practical skills and experience, and problem sessions to develop the student's understanding.

Assessment

The course will be assessed on the basis of student performance in the laboratory sessions and in written coursework.

Laboratory Conduct (50%):

Laboratory conduct – Autonomy and understanding	20%
Laboratory conduct – Quality of Results	10%
Laboratory conduct – Lab Note Book	10%
Laboratory conduct – Oral Presentation	10%

Scientific Writing (50%):

Each student will complete 3,000 words of written coursework as part of this module. Students will receive detailed and bespoke feedback on this coursework in order to improve scientific writing competence in advance of the Literature Review.

Timetable

The Course will run for 12 weeks (early October to late December). Students must be available to attend laboratory classes between 0900 and 1700 although the vast majority of sessions will take place between 1300 and 1700. Sessions are designed to avoid clashes with lecture modules or departmental seminars. A detailed timetable will be provided by your supervisor.