INTRA Programme
B.Sc. Genetics & Cell Biology

Since its establishment in 2004, the B.Sc. in Genetics and Cell Biology (GCB) addresses the training needs of science students in the post-genome era. High calibre students are particularly attracted to this degree, with a consistent high standard maintained since its inception. The focus of the GCB programme is on molecular and cellular biology with a particular emphasis on genetics and bioinformatics. As with all science degrees at DCU, practical training is at the forefront of our programme where students receive 'hands-on' experience in a range of techniques spanning molecular genetics, cell culture, protein manipulation, immunology and bioinformatics.

Programme Outline

The basics of theory and practical biology, chemistry, physics, mathematics and computing are taught in Year 1 of the GCB degree. This ensures that all students have sufficient basic knowledge across the science disciplines before commencing more detailed topics. Year 2 sees students develop a deeper understanding of biochemistry, microbiology, genetics, cell biology and are introduced to the basics of bioinformatics and instrumentation. Minor subjects include chemistry and mathematics. In Year 3 the emphasis switches to more **intense practical training** in advance of INTRA placements (up to six months, April to September). Students undertake four separate practical modules to build on their laboratory experience developed in Years 1 and 2.

Prior to INTRA placement, students will have practical experience in the following:

- Biochemical analyses including enzyme kinetics.
- Protein expression and purification.
- The design and execution of PCR based assays including recombinant DNA cloning and genome database mining.
- Genetic transformation of plants and plant cell culture.
- Growth, identification and manipulation of bacterial cultures.
- Introductory bioinformatics including homology estimation and multiple sequence alignments.
- Immunology techniques such as antibody production and ELISA.
- Data analysis and statistics.
- Report writing.
- Published literature surveys.

Graduate Attributes

We recognise the importance of desirable attributes among our graduates in a company setting. Apart from excellent scientific training, our range of modules also encourage our students to develop into balanced, outgoing, professional, articulate individuals with an ability to use their own initiative and to work as part of a team.

Work Areas

The interdisciplinary nature of the programme will strengthen the marketability of students, who will have the ability to work in a variety of areas:

- Microbiological analysis
- Recombinant DNA cloning
- Protein expression & purification
- Biochemical analysis
- Molecular biology
- Food processing
- Quality control/assurance
- Animal/plant cell culture
- Microbiological Analysis
- Immunological analysis
- Molecular genetics/genomics
- Environmental analysis

Student Availability

Students are available for interview from October onwards. Please post vacancies on the *INTRA* online website at **www.intra.dcu.ie**, or send details to:

INTRA Unit, Student Support & Development,
Dublin City University,
Glasnevin, Dublin 9, Ireland.

Phone: 00 353 1 700 5514
Fax: 00 353 1 700 5505
Website: www.intra.dcu.ie

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B.Sc. Genetics & Cell Biology

Year 1

BIOLOGY	CHEMISTRY	PHYSICS	MATHEMATICS	COMPUTING

Year 2

BIOLOGY
Biomolecules & metabolism
Microbiology & genetics I, II
Cell structure & function
Scientific literature essays
Pharmaceutical & biological chemistry

CHEMISTRY, MATHS
Data analysis & statistics
Organic chemistry
Bio-organic & pharmaceutical chemistry
Introduction to differential equations

PRACTICALS
Practical biochemistry & microbiology
Instrumentation, computing & introduction to bioinformatics

Year 3

BIOLOGY
Gene Cloning & expression
Biochemical & microbiological analysis
Comparative genomics & developmental biology
Cell culture & tissue biochemistry
Science, ethics & society

PRACTICALS
Plant culture & analytical microbiology
Bioinformatics & gene cloning
Protein expression, purification & analysis
Immunology techniques

I N T R A

Year 4

BIOLOGY
Proteomics & protein biotechnology
Current topics in molecular biology
Immunology & immunoanalysis
Human molecular genetics & plant biotechnology
Animal cell biotechnology
Literature review & presentation

PRACTICALS
Methods in cell culture
Advanced laboratory techniques in molecular biology
Research project

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