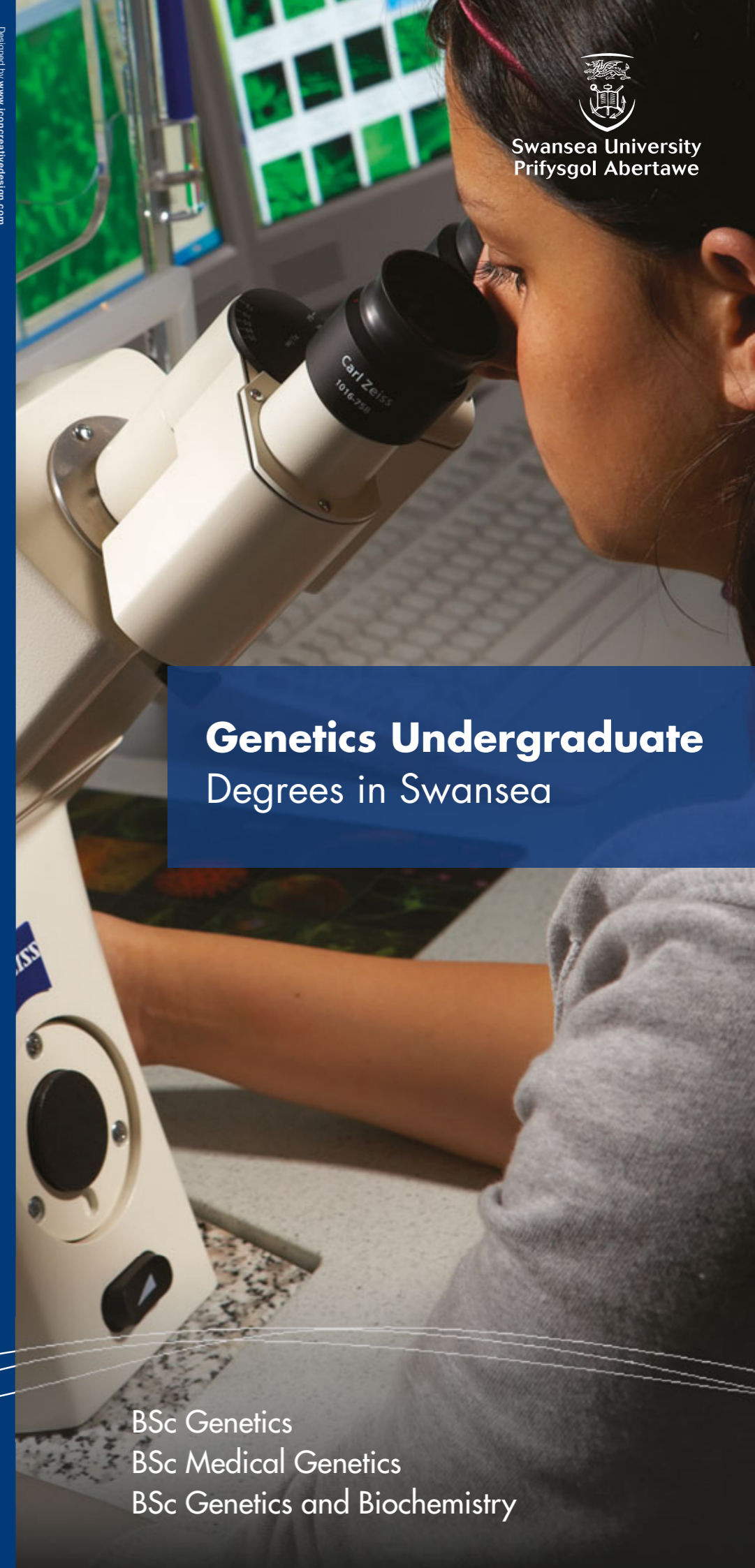




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## Genetics Undergraduate Degrees in Swansea

Swansea University has offered Genetics BSc degrees since the 1960s, one of the first Institutions in the UK to do so. The academic staff in the Genetics Group are members of the College of Medicine and have offices and laboratories in the new Institute of Life Sciences building.

Swansea offers single honours degree courses in 'Genetics' and 'Medical Genetics', and a joint honours degree course in 'Genetics and Biochemistry'.

### Genetics staff and research interests

Staff within the College of Medicine carry out research and teaching in a wide range of areas relating to genetics and molecular biology. Human research is important but there are also important areas of research on other mammals, invertebrates, and microbes such as yeast and Streptomyces. The Genetics Group is responsible for the teaching of the genetics degree courses from within the College of Medicine.

The following staff, with research interests indicated, are the core contributors to the 'Genetics' and the 'Medical Genetics' degree courses.

- |                            |  |
|----------------------------|--|
| Dr Ricardo Del Sol Abascal | - Streptomyces genetics and nanotechnology   |
| Dr Ed Dudley               | - Biomolecular mass spectrometry   |
| Professor Paul Dyson       | - Microbial genetics   |
| Dr George Johnson          | - DNA damage, genetic toxicology and cancer  |
| Dr Hugh Jones              | - Protein engineering  |
| Dr Geertje van Keulen      | - Microbial physiology, regulation of antibiotic production, environmental stress, anaerobic metabolism and fermentation |
| Dr Colin Restall           | - Biochemistry of membrane systems, membrane dynamics  |
| Dr Paula Row               | - Membrane trafficking, cell signalling, ubiquitination, molecular basis of disease                                      |
| Professor David Skibinski  | - Evolutionary genetics, biostatistics and proteomics  |
| Dr Masood Yousef           | - Chemistry of pharmaceuticals, mass spectrometry  |

The following staff members, with research areas indicated, are also involved in teaching elements of the genetics degree programmes. Many are also active in clinical work in local hospitals.

<http://www.swansea.ac.uk/medicine/BScProgrammes/GeneticsandBiochemistryStaff/>

- |                      |  |
|----------------------|--|
| Prof Stephen Bain    | - diabetes   |
| Prof Gareth Brenton  | - mass spectrometry  |
| Dr Steven Conlan     | - eukaryotic gene regulation and Centre for NanoHealth               |
| Dr Angharad Davies   | - genetics and diagnosis of infectious diseases                      |
| Dr Jeff Davies       | - inherited human neurological and cardiac disorders                 |
| Dr Peter Davies      | - ethics of genetic testing and Expedition medicine                  |
| Dr Shareen Doak      | - nanomedicine, nanotoxicology and cancer research                   |
| Dr Rossen Donev      | - molecular psychiatry and psychopharmacology                        |
| Dr Deya Gonzalez     | - reproductive biology and the genetics of fertility                 |
| Dr Llinos Harris     | - genetics and diagnosis of infectious diseases                      |
| Prof Julian Hopkin   | - genetics of asthma and allergy                                     |
| Prof Gareth Jenkins  | - DNA damage and cancer  |
| Dr Diane Kelly       | - pharmacogenetics   |
| Dr Paul Lewis        | - drug discovery and bioinformatics                                  |
| Prof Gareth Morgan   | - developmental medicine (paediatrics and immunity)                  |
| Prof Mark Rees       | - inherited human neurological and cardiac disorders                 |
| Dr Sarah Rees        | - tissue engineering and applications in musculoskeletal medicine    |
| Prof Martin Sheldon  | - reproductive immuno-biology  |
| Dr Jeffrey Stephens  | - diabetes and Cardiovascular genetics                               |
| Dr Cathy Thornton    | - newborn immunity and allergy                                       |
| Prof Johannes Thome  | - molecular psychiatry and psychopharmacology                        |
| Prof K Venkateswarlu | - pharmacology and molecular cell signalling in immunity and allergy |
| Dr Tom Wilkinson     | - microbiology and infection research group                          |

Further information is available via the Genetics Group web page.  
<http://www.swan.ac.uk/medicine/BScProgrammes/>

### Entry Requirements

You normally need three A-levels or equivalent, one of which must normally be Biology. For Medical Genetics, A-level Biology & Chemistry are normally required. Typical offers: for three A-levels 300-320 tariff points.

- |                               |                  |
|-------------------------------|------------------|
| BSc Genetics                  | Course code C400 |
| BSc Medical Genetics          | Course code C431 |
| BSc Genetics and Biochemistry | Course code CC47 |

The UCAS institution code is **SWAN S93**

### Enquiries

Admissions Tutor: Dr Hugh Jones  
Tel: +44 (0) 1792 295668 Email: [d.h.jones@swansea.ac.uk](mailto:d.h.jones@swansea.ac.uk)

[www.medicine.swansea.ac.uk](http://www.medicine.swansea.ac.uk)

Swansea University, College of Medicine, Singleton Park, Swansea SA2 8PP Tel: 01792 513400

BSc Genetics  
BSc Medical Genetics  
BSc Genetics and Biochemistry



## Opportunities in Genetics

Genetics is a growing subject which is making enormous impact in many scientific areas, partly as a result of the sequencing of the entire genomes of humans and other species. These areas include the study and treatment of a huge variety of human diseases, the development of pharmaceuticals, the application of DNA databases in forensic work, and the study of evolution and biodiversity for example in relation to conservation and the effects of global warming.

- The Genetics degree in Swansea has been formulated to benefit from research strengths in molecular genetics, bioinformatics, medical genetics and environmental science.
- The Medical Genetics degree involves teaching input from the medical professionals within the College of Medicine, many of whom work as doctors and consultants in local hospitals.
- The Genetics and Biochemistry degree takes advantage of a strong tradition of teaching and research expertise in biochemistry at Swansea.

We offer expert careers advice throughout the course and students graduating in Genetics find a variety of positions open to them following graduation. Most of our graduates find employment as professional biologists or go on to study for masters or fully funded doctoral degrees and subsequently achieve careers in industry and academia. The Medical Genetics course is an appropriate training for students wishing to train as medical doctors. Although we cannot guarantee placement on graduate entry medical programmes following graduation with a genetics degree, we can provide appropriate help and guidance.

*“My undergraduate degree in Genetics sparked my interest in becoming a professional scientist and provided the foundation to pursue a postgraduate degree (also in Swansea) and establish a research career in molecular mutagenesis and carcinogenesis at Imperial College, London, before joining the pharmaceutical industry as a genetic toxicologist. I now head up the genetic toxicology unit for GlaxoSmithKline, a role which contributes to the development of new medicines to address the unmet medical needs of patients in many disease areas.”*

**Dr Anthony Lynch,**  
Global Director Genetic Toxicology,  
GlaxoSmithKline

## General Information on Genetics Degree Courses

The home department of the students pursuing genetics degrees is the College of Medicine. At all levels (years), teaching is carried out under the modular system. Each module is concerned with a specific topic and usually carries 10 credits. Students follow modules giving a total of 120 credits at each level. Most modules consist of about 15 lectures and associated practical classes given over a period of 5 weeks. Students will normally complete one or more marked assignments such as practical write-ups for each module and undertake a written exam. There is some flexibility for students to change degree scheme during Levels 1 or 2.

At each level students have both personal and academic tutors who monitor their progress and are available to discuss both academic and any other problems that students might wish to raise.

An important module at each level is the tutorial module (called ‘Genetic Analysis’). In this module, the student develops a vast array of transferable skills. They are introduced to the scientific literature and receive guidance in essay writing, analysis of scientific problems, preparing presentations, giving feedback to peers and participating in scientific discussion and debate in small groups under the supervision of members of staff.

### Research Project

A key component at Level 3 is the research project (30 credits) where students carry out research in a laboratory in the College of Medicine on a novel problem at the frontiers of scientific research. Project students have the opportunity to work in research laboratories equipped to the highest standards. Facilities include a range of;

- DNA and protein analytical equipment,
- computer based image analysers for molecular or cellular studies, and
- a powerful supercomputer facility.

Project topics are offered from the contributing staff as listed on the back page of this pamphlet. There is the opportunity for hands-on experience of techniques such as

- DNA fingerprinting,
- PCR,
- proteomics,
- fluorescence microscopy, and
- computer approaches to the study of sequenced genomes.

Students benefit from the opportunity to attend research talks which are held at least weekly. These are given by Swansea staff or by speakers from other universities or research institutes. There are some opportunities for taking time out for spending periods of research in industrial or medical laboratories either in the UK or abroad.

## Our Teaching Scheme

### Teaching in Level 1 (Year 1)

In the first year students pursue a broad range of modules across the whole range of biology including genetics. Further study of genetics and medical genetics topics takes place in the genetic analysis tutorial module.

### Teaching in Level 2 (Year 2)

In the second year, students take specialised modules in genetics given by the College of Medicine which are wide-ranging but focus on human and medical genetics, microbial genetics, gene expression, the genetics of behavioural traits, proteomics, the molecular basis of disease and diagnosis, and the study of molecular techniques used in genetics. An introduction to specialist areas in genetics is given in the genetic analysis tutorial module.

### Teaching in Level 3 (Year 3)

In the final year, the modules allow students to pursue specialised topics in greater depth. Many of the topics are related to the research strengths of the academic staff.

Students studying for a **Genetics degree (C400)** would normally follow modules covering the areas of recombinant DNA technology, human genetics, biotechnology and protein engineering, molecular evolution, animal developmental genetics, genetic analysis, and carry out a 30-credit project module in an appropriate area of genetics.

Students studying for a **Medical Genetics degree (C431)** would normally follow modules including gene manipulation, biotechnology and protein engineering, medical genetics, mutations and human health, cancer genetics, animal development, and genetic analysis, and carry out a 30-credit project in an area of medical genetics.

Students in both Genetics and Medical Genetics would have the possibility of pursuing some optional modules according to interest, for example in human biochemistry, or biological statistics and experimental design.

