The academic staff in the Biochemistry Group are members of the College of Medicine and have offices and laboratories, primarily in the new Institute of Life Sciences building. The Group represents a diverse team of research active academics with interests as far ranging as novel antibiotic development, cellular control of protein degradation, cancer biomarker discovery, soil hydrophobicity and chemical ecology.

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

Biochemistry staff and research interests
Staff within the College of Medicine carry on research and teaching in a wide range of areas relating to biochemistry 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 and Biochemistry Group is responsible for the teaching of the biochemistry degree courses from within the College of Medicine and the staff and their research interests are listed below:

Dr Ricardo Del Sol Abascal – Streptomyces genetics and nanotechnology
Dr Ed Dudley – Biomedical mass spectrometry, proteomics and metabolomics
Professor Paul Dyson – Membrane genetics
Dr George Johnson – DNA damage, genetic toxicology and cancer
Dr Hugh Jones – Protein engineering
Dr Geoffje van Keulen – Microbial physiology, regulation of antibiotic production, environmental stress, anaerobic metabolism and fermentation
Dr Colin Revel – Biochemistry of membrane systems, membrane dynamics
Dr Paula Row – Membrane trafficking, cell signalling, ubiquitination, molecular basis of disease
Dr Hugh Jones – 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 biochemistry and genetics degree programmes. Many are also active in clinical work in local hospitals.

Prof Stephen Bain – diabetes
Prof Gareth Brenton – mass spectrometry
Dr Steven Conlan – eukaryotic gene regulation and Centre for NanoHealth
Dr Jeff Davies – inherited human neurological and cardiac disorders
Dr Simon Fox – pediatric medicine and Centre for NanoHealth
Dr Hugh Jones – molecular psychology and psychopharmacology
Dr Jeffery Stephens – reproductive immunology
Dr Cathy Thornton – newborn immunity and allergy
Dr Tom Wilkinson – microbiology and infection research group

Further information is available via the Biochemistry 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 Chemistry and another preferably Biology.
Typical offers: for three A-levels 300-320 tariff points.

BSc Biochemistry Course code C700
BSc Medical Biochemistry Course code C741
BSc Genetics and Biochemistry Course code CC47

The UCAS institution code is SWAN S93

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BSc Biochemistry
BSc Medical Biochemistry
BSc Genetics and Biochemistry
Opportunities in Biochemistry

Biochemistry represents the understanding of cellular processes at the chemical level, allowing for an understanding of the biochemical processes and interactions that are present in healthy and diseased states. Biochemistry includes the study and treatment of a huge variety of human diseases, the development of pharmaceuticals, the understanding of cellular control mechanisms and the complex interactions between microbes, our environment and us. Furthermore, Biochemistry has been at the forefront of biomedical developments advancing our understanding of diseases at the molecular level and the development of novel treatments.

The degree schemes offer College of Medicine research facilities, which include the Biomolecular Analysis Mass Spectrometry (BAMS) laboratories which allow post-genomic studies such as functional proteomics and metabolomics.

- The Biochemistry degree in Swansea has been formulated to benefit from research strengths in molecular cell biology, microbiology, biomolecular mass spectrometry and environmental science.

The degree also provides a detailed knowledge at the chemical and molecular level, of the structure and function of living organisms, from bacteria to plants and animals.

Medical Biochemistry involves further teaching input from the medical professionals within the College of Medicine, many of whom work as doctors and consultants in local hospitals.

Students graduating in Biochemistry find a variety of positions open to them following graduation, including positions in pharmaceutical companies, hospital laboratories and academia: some undertake careers in fields as diverse as teaching, scientific publication management, forensic science and scientific sales. We offer expert careers advice throughout the course itself and also to our graduates. Although most of our graduates find careers that are closely allied to their degree subjects, they also learn a vast array of transferable skills that are applicable to most career options: this provides them with access to a diverse range of potential career choices after their degree.

The Medical Biochemistry course provides appropriate training for students wishing to train as medical doctors. Although we cannot guarantee placement on graduate entry training in medicine, many students have undertaken placements following graduation, including careers in the private medical sector.

Medical Biochemistry involves further teaching input from the medical professionals within the College of Medicine, many of whom work as doctors and consultants in local hospitals.

“Biochemistry research project was a great opportunity to further myself, allowing me to not only learn about the intricacies of biochemistry but also preparing me for a future career in science and research. The academic staff are always approachable and helpful.”

Alun Newsome
Third year Medical Biochemistry undergraduate

General Information on Biochemistry Degree Courses

The home department of the students pursuing biochemistry 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 1.5 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 schemes 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 they may have.

Research Project

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

- Bioanalytical equipment such as HPLC, GC and Mass spectrometry
- 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

- ELISA protein visualisation and quantitation analysis,
- Proteomics,
- Bioanalytical chemistry and separation sciences,
- fluorescence microscopy, and
- analysis of antibiotic production by bacteria and other organisms.

For Medical Biochemistry students, project topics include a wide range of medical areas, including cancer research and the identification of the genes involved in diseases such as diabetes and asthma.

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 and chemistry, including biochemistry. Further study of biochemistry and medical biochemistry topics takes place in the tutorial module.

Teaching in Level 2 (Year 2)

In the second year, students take specialised modules in biochemistry given by the College of Medicine which are wider ranging but focus on biochemical techniques that can be used in scientific investigation, metabolic pathways involved in the biochemical conversions of sugars and fatty acids, biomolecular mass spectrometry (including protein analysis), enzymology and its role in metabolic regulation and clinical biochemistry.

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 Biochemistry degree (C700) would normally follow modules covering the areas of recombinant DNA technology, biotechnology and protein engineering, membranes and energy transduction pathways and nuclear acid metabolism / chemical modification. Students also undertake a 30-credit project module in an appropriate area of biochemistry.

Students studying for a Medical Biochemistry degree (C741) would normally follow modules including aspects of sensory and metabolic biochemistry, the biochemistry of natural products, mutations and human health, medical genetics, membrane trafficking of proteins and carry out a 30-credit project in an area of medical biochemistry.

Students in both Biochemistry and Medical Biochemistry would have the possibility of pursuing some optional modules according to interest, for example in molecular evolution, cell physiology / immunobiology and genetics of cancer.