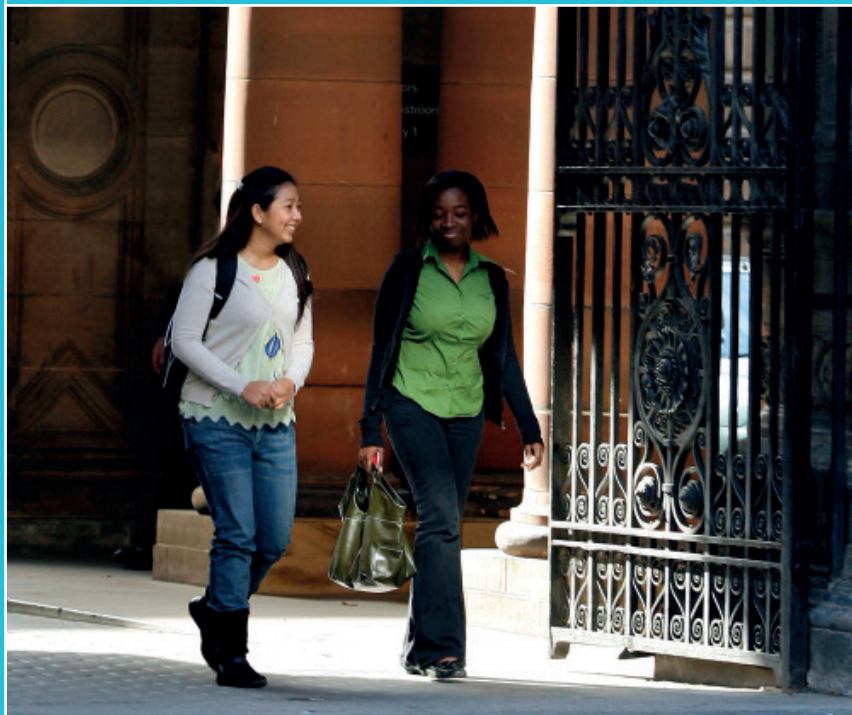




THE UNIVERSITY *of* EDINBURGH
Edinburgh Medical School

Biomedical Sciences

Introducing
Biomedical Sciences at the
University of Edinburgh



Welcome

Welcome to our booklet designed to give you an introduction to Biomedical Sciences at the University of Edinburgh. We aim to give you a short guide to what our programmes offer and the minimum entry requirements you will need in order to be eligible to apply. We hope you will find this useful in determining whether one of our programmes is right for you.

The Biomedical Teaching Organisation

“Studying Biomedical Sciences at the University of Edinburgh is fascinating: the environment is stimulating and it gives you the opportunity to have an overview of the different topics this subject comprises, before choosing what you are going to specialise in. I particularly enjoy the approach of teaching, that aims to make you understand the logical mechanisms of human body function.”

Teresa Spano, Year 3, BSc (Hons) Biomedical Sciences (Physiology).

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What Can I Study

Biomedical Sciences involves the study of the processes underlying human health and disease and some of the UK's most outstanding biomedical research is carried out in Edinburgh. This world-leading research, as well as driving and guiding developments in medical practice, fosters a dynamic learning and teaching environment in which our students acquire knowledge and develop skills through access to this top-rated teaching and research expertise.

Our strengths in teaching and research are reflected in the themes that direct each year of our biomedical programmes. In years 1 and 2 our biomedical programmes provide a firm grounding in the knowledge, understanding and skills required in the disciplines of infectious diseases, neuroscience, pharmacology, physiology and reproductive biology. In years 3 and 4 individual programmes focus on exploring the discipline in depth through a development of the research skills needed to investigate, interpret and analyse new findings that will advance knowledge and understanding. Year 4 provides the opportunity to actively engage in research by undertaking project work with one of our research groups.

We offer the following Honours programmes,

- BSc Hons Infectious Diseases (C590)
- BSc Hons Neuroscience (B140)
- BSc Hons Pharmacology (B210)
- BSc Hons Physiology (B120)
- BSc Hons Reproductive Biology (C142)
- BSc Hons Biomedical Sciences (C190)

In the first and second years all of our biomedical programmes share a common structure and the same compulsory courses. The third and fourth years of the programmes focus in depth on the specific disciplines. In each subject area the syllabus is constructed from a combination of compulsory, discipline-specific courses and student-selected (elective) courses aimed at broadening understanding of the discipline.

Choosing/Changing your Honours (Year 3 and 4) specialisation

Your choice of Honours specialisation is confirmed at the end of year 2. You are not obliged to continue in the discipline that you entered at the beginning of year 1. The year 1 and year 2 programme provides a breadth of knowledge across all the Honours disciplines that allows you to change your specialisation choice at the end of year 2 if you have decided that one of the other biomedical disciplines is now of more relevance to you.

There is also sufficient flexibility within the biomedical programmes that, with appropriate choice of third year elective courses, a change in Honours specialisation may also be possible at the end of year 3.



Study Year by Year

Pre-Honours – Year 1

The main theme you will study is the importance of biomedical sciences to medicine and health. You will learn how biomedical science discoveries and breakthroughs in understanding have led to medical and scientific advancement.

You will take three compulsory courses: Biomedical Sciences 1; Molecules, Genes & Cells 1; and Medical Biology 1. Students will also be expected to take at least one course in Biological Chemistry. You will choose other courses from a range of biomedical and non-biomedical options.

Pre-Honours – Year 2

The theme of your second year is foundational understanding of biomedical sciences and it includes essential learning applicable to biomedical disciplines.

You take three compulsory courses: Biomedical Sciences 2; Microorganisms, Infection & Immunity 2; and Cells to Organisms 2. You will choose other courses from a range of biomedical and non-biomedical options.

Honours – Years 3 and 4

For all specialisations the theme of year 3 is “developing knowledge from experiment” while in year 4 it is “research in practice”. In years 3 and 4 individual programmes focus on exploring these themes in relation to the specific discipline through a development of the in-depth knowledge and research skills needed to investigate, interpret and analyse new findings that will advance knowledge and understanding. Study aims to develop key graduate attributes, including skills in analysis, communication and research and enquiry.

In year 4 students will have the opportunity to actively engage in research by undertaking compulsory project work with one of our research groups. Each student will have individual supervisor support while engaging with a major research project that can involve original laboratory-based research or data/literature analysis-based research.



Honours Specialisations

Infectious Diseases

Infectious diseases present a significant global healthcare problem: every year they cause 25% of all deaths worldwide and 43% of deaths in the developing world. We are now faced with the rapidly growing problem of antibiotic resistance and the threat of pandemics of untreatable emerging and re-emerging infections.

The pathology of infectious diseases is a result of a complex interplay between pathogens (bacteria, viruses, protozoa, fungi, nematodes and other agents) and their hosts. Gaining an understanding of the interactions between pathogen and host allows us to unravel pathogen-induced disease mechanisms. Applying this knowledge to diagnostics and therapeutics permits more effective detection, control and cure of infectious diseases.

Year 3

You study three compulsory courses: Biomedical Sciences 3, the cornerstone to the theme of developing knowledge from experiment; Medical Microbiology 3 and either Immunology 3 or Clinical Immunology and Haematology 3A. In addition, you will study further, individually selected, biomedical courses.

Year 4

You study the compulsory course Host-Pathogen Interactions in Infectious Diseases, together with two option courses covering cutting-edge topics in more depth, such as Global Health and Infectious Diseases or Diagnostics and Therapeutics for Infectious Disease.

Neuroscience

Neuroscience is the study of the nervous system, the workings of the brain and the interaction of cells in the control of behaviour. It is an interdisciplinary field involving biology, chemistry, physics, anatomy, physiology and behavioural studies. Areas of interest to neuroscientists range from the molecular and physiological study of single neurons to the basis of complex cognitive phenomena such as consciousness and memory. The applications of such research are numerous and include the use of diagnostic imaging techniques such as PET scans and MRI and the development of drugs for treating neurodegenerative conditions, such as Alzheimer's and Parkinson's diseases, and psychiatric illnesses.

Year 3

You study two compulsory courses: Biomedical Sciences 3, the cornerstone to the theme of developing knowledge from experiment; and Neuroscience 3. In addition, you will study further, individually selected, biomedical courses such as Mechanisms of Brain Development 3.

Year 4

You study two compulsory courses: General Neuroscience; and Project Management, together with two option courses covering cutting-edge topics in more depth, such as Developmental and Clinical Neuroscience or Neurobiology of Cognition.

Pharmacology

In essence pharmacology is the study of how both natural and synthetic chemical agents affect biological systems. Pharmacologists study the derivation, chemical properties, modes of action, physiological and behavioural effects and therapeutic uses of these agents. It can be studied at all levels from the cell to the whole organism. Pharmacology is a multidisciplinary field with researchers employing many approaches from genomic and proteomic studies to the use of computational models of drug actions and interactions.

Year 3

You study two compulsory courses: Biomedical Sciences 3, the cornerstone to the theme of developing knowledge from experiment; and Pharmacology 3. In addition, you will study further, individually selected, biomedical courses such as Applied Pharmacology 3.

Year 4

You study the compulsory course Drugs, Receptors and Therapeutics, together with two option courses covering cutting-edge topics in more depth, such as Cardiovascular Pharmacology and Therapeutics or Endocrine Physiology and Pharmacology.

Physiology

Physiology is the study of living animals from the subcellular level to the whole organism. Using techniques such as cell and molecular biology, bioinformatics, genetics and genomics, chemistry and engineering physiologists examine the function of individual molecules and how they interact to drive the function of cells, tissues, organs, organ-systems and organisms. It could be argued that physiology forms the basis for all biomedical sciences and clinical medicine is underpinned by an understanding of molecular, cellular and organ-system physiology.

Year 3

You study two compulsory courses: Biomedical Sciences 3, the cornerstone to the theme of developing knowledge from experiment; and Physiology 3. In addition, you will study further, individually selected, biomedical courses such as Pharmacology 3 and Neuroscience 3.

Year 4

You study the compulsory Physiology core course, together with two elective courses covering cutting-edge topics in more depth, such as Sensory Physiology and Dysfunction and Integrative Physiology.

Reproductive Biology

The study of reproductive biology has provided the scientific background for *in vitro* fertilisation and other assisted conception techniques that have revolutionised medical and veterinary practice in the last twenty years. It has also helped shape powerful research tools such as the production of transgenic animals and cloning. The reproductive system is recognised as a unique model for many other physiological processes in health and disease. It involves cyclical episodes of inflammation, blood vessel growth and tissue remodelling, normally only associated with the development of pathology. This programme looks at the requirements for reproduction, including the production of sufficient numbers of viable gametes, fertilisation, implantation in a receptive uterus, formation of the placenta and delivery at full term.

Year 3

You study two compulsory courses: Biomedical Sciences 3, the cornerstone to the theme of developing knowledge from experiment; and Reproductive Biology 3. In addition, you will study further, individually selected, biomedical courses such as Developmental Biology 3 or Neuroscience 3.

Year 4

You study two compulsory courses: Reproductive Biology Project Planning and Practical Skills; and Research Skills in Reproductive Biology, together with two option courses covering cutting-edge topics in more depth, such as Reproductive Systems and Conception to Parturition.

Biomedical Sciences

The ultimate aim of biomedical sciences is to understand the functioning of the human body at the molecular, cellular, organ and system levels, in health and disease. Biomedical scientists integrate knowledge gained by research across a range of related disciplines and apply this to the analysis of disease mechanisms. The basic research carried out by biomedical scientists is fundamental to development and innovation in disease diagnosis, treatment and prevention. This programme develops scientific, experimental and critical analysis skills, the application of which to research may facilitate the improvement of health and prolongation of life.

Year 3

You study the compulsory course Biomedical Sciences 3, the cornerstone to the theme of developing knowledge from experiment. In addition you must study at least one of the following: Clinical Biochemistry and Endocrinology 3, Clinical Immunology and Haematology 3A, Medical Microbiology 3, Mechanisms of Brain Development 3, Neuroscience 3, Physiology 3, Pharmacology 3 and Reproductive Biology 3.

Year 4

You study two compulsory courses: Biomedical Sciences and Critical Analysis Skills in Biomedical Sciences, together with two option courses covering cutting-edge topics in more depth, such as Cancer Biology and Medicine and Making Sense of Disease Pathways.



Academic Requirements

In order to be considered for a place, all applicants must meet our minimum academic requirements. Below we cover our standard entry requirements from the UK along with a link to our website for the less common qualifications we accept from elsewhere in the world.

All applicants must also meet our general university entry requirements including SQA, GCSE or equivalent English language requirements.

You can find the University's approved subject listing online at: www.ed.ac.uk/studying/undergraduate/entry-requirements/approved-subjects

It is important to be aware that demand for places on our Biomedical programmes is much higher than places available so applicants who meet the minimum academic requirements are not guaranteed an offer of studies. The majority of offers will be made to students who achieve grades well above the minimum academic requirement.

SQA Highers

ABBB by end of S5 or ABBBB/AABB from S4 – S6, to include Biology and Chemistry. Mathematics and/or Physics are recommended. Qualified applicants are advised to take Biology and Chemistry at Advanced Higher level where possible. Standard Grades: Mathematics at Grade 2. English at Grade 3 (or National 5 Mathematics at Grade B and English at Grade C).

Typical offer: AABB by the end of S5 or AAAA/AAABB in S4 – S6.

Second year entry: Advanced Higher AB to include Biology and Chemistry.

GCE A Level

ABB, in one sitting, to include Biology and Chemistry. Mathematics and/or Physics are recommended. GCSEs: Mathematics at Grade B and English at Grade C.

Typical offer: ABB in one sitting.

Second year entry: AAB in one sitting, to include Biology and Chemistry.

International Baccalaureate

Overall score of 32 points, including HL Biology and Chemistry, one at Grade 5 and one at Grade 6. Mathematics and/or Physics are recommended. SL: English at Grade 4 and Mathematics at SL Grade 4.

Typical offer: 36 points overall with 555 at HL.

Second year entry: Overall score of 36 points, including HL Grade 6 Biology and Chemistry.

HNC/HND

We welcome applications from individuals holding HNC and HND qualifications for entry into the Medical Sciences programme. Given the wide range of HNC/HND qualifications available and the different grading of assessments it is difficult to provide specific minimum academic requirements. Nevertheless, we would expect the HNC/HND to have substantial credit weighting in the Biological/Biomedical subject area and in Chemistry. Where grades are awarded alphabetically we would require a minimum of a B grade overall and where a Pass/Merit/Distinction classification is used we would require a minimum of a Merit overall.

For further information about various UK qualifications, please consult the information here:

www.ed.ac.uk/studying/undergraduate/entry-requirements

For countries outside the UK from which we commonly accept applications please use the following URL for up to date information.

www.ed.ac.uk/studying/international/country

Non-Academic Evidence

In terms of your personal statement we are looking for the following: Biomedical Sciences mentioned as your top priority; indicate importance/give examples of biomedical science in society/healthcare; aware of importance of research; mention career plans; work experience (lab based); explanation of relevance of work experience to chosen programme of study; other interests showing responsibility/representation.

Frequently Asked Questions

How will I be taught?

Through a combination of lectures, tutorials, practical work, problem-based learning and computer-assisted learning. In third and fourth year there is a greater emphasis on self-directed study and discussion sessions with academic staff.

How will I be assessed?

In-course assessment and exams are used in all years of the programmes. Your degree classification will be based on your performance in years 3 and 4 with a 1:2 weighting.

Where will I be taught?

Teaching takes place at both the University's Central Area and King's Buildings Campus. You will have access to the University's libraries and computer labs. Study materials are available online.

Will I be able to transfer into a different programme at the University?

There are procedures in place for transferring to different degree programmes though transfers are governed by a range of factors such that the freedom to transfer is degree programme dependent and cannot be assumed. If you are interested in attempting to transfer degree programme you should first contact the School running the programme into which you wish to transfer to discuss their requirements. We would expect you to also discuss this with your Personal Tutor beforehand. It is important to understand that transfer to the MBChB programme is very unlikely.

Career opportunities

Our programmes will appeal to those planning a career in biomedical research or related areas as well as graduate-level entry careers in industry, management and the public sector. The broad analytical, scientific and personal skills you gain will equip you for a variety of careers.

Previous graduates have been employed in science and in non-science sectors including teaching, marketing, accountancy and policy research. A large proportion of graduates choose further study before entering successful academic or industry-based research careers.



“I have thoroughly enjoyed my time studying at the University of Edinburgh so far and have found all of my courses very interesting. Lecturers and other staff are always friendly and approachable contributing to a positive learning experience. I hope to eventually pursue a career in Biomedical Science research.”

Robin Macrae, Year 3, BSc (Hons) Biomedical Sciences (Pharmacology).



Student Support

Biomedical Teaching Organisation

The Biomedical Teaching Organisation (BMTO) is responsible for all aspects of management, administration and delivery of undergraduate and postgraduate teaching within Edinburgh Medical School: Biomedical Sciences. We guide you through your academic journey from pre-arrival and Welcome Week, the critical first steps in your studies which include important meetings and induction events, to graduation and your transition into a new career or postgraduate study. We will respond with help and advice to your questions about any subject at any stage of your studies.

Personal Tutor

Your Personal Tutor is there to help you make the most of your studies as an individual, providing you with academic advice and support as you progress through your university career. You will meet with your PT at least once every semester, but you can also arrange an appointment at any time during the academic year.

The benefits of the Personal Tutor system

- Supporting you to become a confident learner in your discipline
- Encouraging you to play an active part in your academic community
- Supporting you to develop and reflect on the range of graduate attributes required for success at university and beyond
- Supporting you to meet the challenges and opportunities of University life
- Reflection on your academic progress
- Development of your academic skills
- Reflection on your effective use of feedback

Academic Families

Our Academic Families bring together students from across the Biomedical Sciences programmes providing a framework for peer-assisted support and guidance. The aims of the Academic Family system are to encourage the forming of relationships, to foster a sense of belonging to the University and to ensure that new students quickly feel part of the Biomedical Sciences community. Academic Families allow space for incoming students to ask about course choices, common pitfalls or even the best places to go out. They also give the higher year students the opportunity to nurture newer students and facilitate their learning. Academic families offer a safe and welcoming environment where new students can feel comfortable in seeking advice and guidance.

In 2016, just two years in to our Academic Families Scheme, Biomedical Sciences was awarded an Edinburgh University Student Association Impact Award for Best Peer Support Group.

“One of the highlights of my degree was the opportunity to do my Honours project at the Roslin Institute. It not only helped me to apply my theoretical knowledge to a research project, but it also greatly enhanced my research skills and confidence to pursue research on a graduate level.”

Kristina Kovacikova, Graduate from BSc (Hons) Biomedical Sciences (Infectious Diseases) (2015).

How do I find out more?

Further information about the Biomedical Sciences degree programme can be obtained from:

Biomedical Teaching Organisation (BMTO)
The University of Edinburgh
Medical School
Teviot Place
Edinburgh, EH8 9AG

Tel: 0131 650 3160
Email: BMTO@ed.ac.uk

For more detailed information on degree structure and content, please also see: www.ed.ac.uk/studying/undergraduate/degrees



