

MEDICAL SCIENCES
SPORT AND EXERCISE
MEDICAL SCIENCES

UNDERGRADUATE SUBJECT BROCHURE 2019
EXETER CAMPUS



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 I chose this degree because I really loved the idea of being able to learn about a wide variety of topics, whilst still being able to specialise in an area that really interested me at the end of the degree. So far I've enjoyed my small group sessions, in first year they were valuable in helping me get to know people on the course whilst also building on valuable team work and independent learning skills. This year I've been really excited by my immunopathology module – one which I was able to choose myself. Over the term we've had guest lecturers who are leading in their field and have also had the opportunity to conduct our very own experiments in the Medical Sciences lab.

Laura, studying Medical Sciences



THE UNIVERSITY OF EXETER MEDICAL SCHOOL

The University of Exeter Medical School delivers several highly-regarded and innovative undergraduate degrees. We have experts leading cutting-edge research in dementia, diabetes, neuroscience, cardiovascular risk and the environment and human health, to name just a few areas. This feeds through to our teaching, giving you unparalleled insights to this exceptional research environment.

The combination of our scientific research and evidence-based approaches to learning and teaching will prepare you to become the scientists and doctors who will overcome current and future challenges in health and social care.

As a student of the Medical School, you'll also benefit from our partnership with the NHS, the cutting-edge research of the Institute of Biomedical and Clinical Sciences in life and medical sciences and various translational health technologies (eg, cardiovascular, diabetes, neuroscience and ageing) and the research of other colleges across the University.



The Athena SWAN Charter recognises and celebrates good employment practice for women working in STEM in higher education and research. The University of Exeter Medical School has been awarded an Athena SWAN Silver department award. Find out more about Athena SWAN in the University of Exeter Medical School at www.exeter.ac.uk/medicine/about/equalitydiversity/athenaswan

www.exeter.ac.uk/ug/medical-sciences



My research looks at the role of epigenetic mechanisms in dementia. We look at epigenetics, which is essentially the addition of chemical tags to the DNA which can turn genes on and off. We look at brain samples from people with dementia to see if we can see these in regions of the brain that might have high levels of Alzheimer's pathology.

At the moment we don't know what causes dementia, so it's particularly important to identify new causes. One of the really interesting things about identifying epigenetic changes is that if we can show they are causative in the disease, they are potentially reversible.

Our end goal is to try and identify new molecular mechanisms that might be involved in the disease which might then help us identify new drug targets for pharmacological intervention. Another key aim of ours is to look in blood samples from people with dementia, try and identify biological markers in blood which could help diagnose the disease a lot earlier.

If we were able to identify new mechanisms that are involved in the disease and we're able to diagnose the disease, then it would have a significant impact on peoples' lives.

Dr Katie Lunnon,
Associate Professor in Epigenetics

MEDICAL SCIENCES

89% of Medical Sciences students in graduate-level employment or further study within six months of graduating¹

83% of research classified as world-leading or internationally excellent (2014 REF)

Awarded by students as Subject with Best Research Community

Combine your degree with a complete research placement in the UK or worldwide, in academia or industry

At present, many scientific discoveries often do not leave the laboratories in which they are made. At the same time, the needs of front-line clinicians – and their patients – often go unheard by those doing research. These career-focused degree programmes train you to fill these gaps, and thereby enhance the lives of patients.

Our Medical Sciences degrees offer an innovative approach to learning, which includes lectures from world-leading experts; student-focused small-group learning; internationally renowned e-learning resources; hands-on sessions in research laboratories and clinical settings; inspirational clinician-scientist-patient sessions; and worldwide professional training placements. The curriculum combines contemporary medical sciences with the training required to undertake cutting-edge research.

Within the Medical Sciences programmes you will be encouraged to think as a scientist by developing your capacity as a competent problem solver. You will apply your knowledge through evaluation of evidence and by presenting or communicating your data with confidence to both specialist and non-specialist audiences. You will have access to modern facilities that include state-of-the-art teaching and research laboratories and collaborative learning environments. The academic, personal and professional support you receive will ensure you are well prepared for future graduate employment or postgraduate training.

Career preparations and employability training run throughout the programme: we recommend that you opt for a Professional Training Year

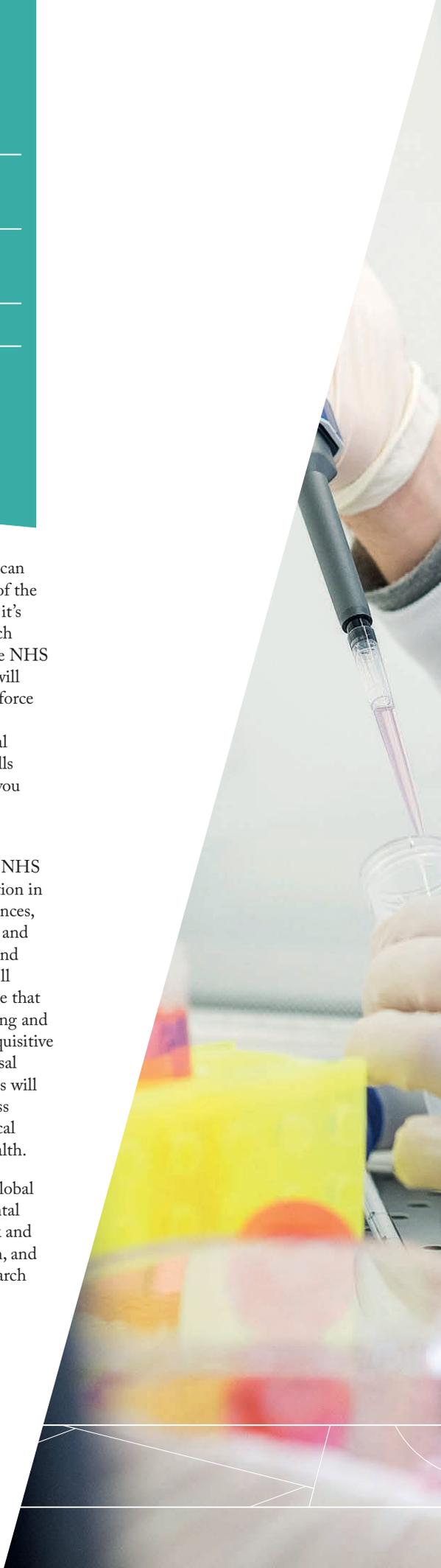
(PTY) to gain first-hand experience. You can spend a year undertaking research at one of the world's leading universities, find out what it's really like to work in a professional research team in the UK or overseas, or work in the NHS research environment. This optional year will increase your employability skills and reinforce your CV. You will contribute to a medical or health related project, with the potential to publish your research. Transferrable skills developed during your PTY will prepare you for a lifelong career.

Medical Sciences has been developed in consultation with industry employers, the NHS and academia and provides a firm foundation in the core biomedical and biomolecular sciences, alongside an insight into medical practice and the biotechnologies used to prevent, test and diagnose disorders and treat patients. You'll develop an integrated, scientific knowledge that you can put into practice in a clinical setting and robust research skills, plus creative and inquisitive communication, leadership, critical appraisal and problem-solving skills. These key skills will prepare you for a career helping to progress scientific discovery into clinical and medical practice, ultimately to improve human health.

Our Medical School is renowned for its global research quality in Neuroscience and Mental Health, Diabetes and Cardiovascular Risk and Ageing, Environment and Human Health, and Health Research. Our education and research therefore stand on a firm evidence-based foundation.

www.exeter.ac.uk/ug/medical-sciences

¹ Destination of Leavers from Higher Education Survey (DLHE) of 2015/16 undergraduates.





PROGRAMME STRUCTURE



The lecturers at the Medical School are always ready to answer any questions the students have, and I have often found myself in a situation where I get one-to-one guidance and teaching during a session – which I have greatly appreciated. I have truly enjoyed being taught by the Medical School staff – they are all very enthusiastic, approachable and experts in their fields.

I did a research internship over the summer with the Health Services and Policy Research Group (The Institute of Health Research, UEMS). I worked with Professor Jose Valderas and his team who are the leading experts on Patient-reported outcome measures (health status assessments coming directly from the patient) in the country and whose research feeds directly into healthcare guidelines and informs policy changes. It was a wonderful experience as I got to work in a team of enthusiastic and knowledgeable researchers and I know that the work I did was valuable and will contribute to something pivotal in the development of healthcare – transitioning to patient-centred care. This internship also allowed me to explore the different areas of research at the Institute of Health Research (and beyond) and will be very helpful when I come to apply for my professional training year, graduate jobs and postgraduate study.

The exposure to world-class research at the Medical School has motivated me to work hard and has assured me that if you put effort into achieving your dreams, you'll eventually do it and you'll be great!

Stanimir, studying
Medical Sciences

SINGLE HONOURS

BSc (Hons) Medical Sciences (EXETER)

B100 3 yrs

with Professional Training Year B101 4 yrs

AAB-ABB | IB: 34-32 | BTEC: DDD-DDM

Required subjects: At least one grade A and one grade B in GCE AL science subjects, one of which must be Biology; at least one HL6 and one HL5 in IB science subjects, one of which must be Biology.

- Explore how things could go wrong in the body due to disease or trauma and how normal function might be restored
- Critically evaluate the evidence into how pharmaceutical intervention may be appropriate in some conditions, while other conditions might best be helped using technology or engineering
- Engage in a wide range of investigative placements both short-term and long-term (eg, PTY)

Year 1 Your first year will develop your existing knowledge and understanding of the functions of the human body. This will be supplemented with training in basic laboratory, research and study skills.

Year 2 This year builds your knowledge, skills and professional aptitudes by reflecting on your previous year's portfolio of achievements and feedback received from tutors and assessments. Core modules focus on mechanisms, treatment and diagnosis of disease and an introduction to the medical research process. You will apply your developing research skills to designing, running, analysing and reporting on your own research project. You can specialise in particular areas of medical science or retain a broad focus to your degree by choosing from a wide range of optional modules.

Year 3 You have the option of completing our highly popular, career-inspiring Professional Training Year (PTY). This is a research placement year in which you will gain first-hand experience of a research environment and develop your employment-focused transferrable skills.

Final Year In the final year you will apply your previous training to an independent research project by working with world-leading health, medical or clinical researchers within the Medical School. This project may involve data collection or the analysis of existing data and will require you to understand and review published scientific literature.

PATHWAYS WITHIN MEDICAL SCIENCES

All students complete the same first year regardless of whether you choose Medical Sciences or one of our four Medical Sciences pathways. Our programme is designed to be flexible so that you can change between pathways, or onto a pathway at the end of Year 1. In Year 2, modules are introduced which are designated to the pathways, and in the final year you will study advanced pathway-specific modules and complete a research project within your chosen area.

These pathways have been developed through discussions with the scientific community to ensure graduates have the skills and knowledge needed to work in the ever evolving workplace. These areas link with the research strengths of the Medical School; this means that you will learn about the most relevant and up-to-date thinking in these fields.

Health Research

EXETER (ST LUKE'S AND STREATHAM CAMPUSES)

Research is essential for improving human health and informs every aspect of clinical practice, social care and public policy. This pathway will introduce you to the fundamentals of health research and explores concepts and scientific procedures such as: quantitative and qualitative research methods, evidence-based clinical practice, evidence synthesis and cost-effectiveness, key ethical issues in health research (eg, consent, confidentiality, deception, coercion and publication bias), basic statistical analyses, the publication and dissemination of research findings, patient and public involvement, and the interconnection between research funding, public policy, and clinical practice.

Human Genomics

EXETER (ST LUKE'S AND STREATHAM CAMPUSES)

Genomics is the study of the structure and function of our genome. Genes are regulated to produce the RNAs and proteins needed for life, and these factors may be influenced by internal factors (such as genetic variation or disease states) or external factors (such as our environment). Powerful technologies in genomics allow us to sequence a person's entire genetic code, giving insight into the mechanisms of normal and pathological states, as well as the identification, diagnosis and treatment of genetic disorders.

Neuroscience

EXETER (ST LUKE'S AND STREATHAM CAMPUSES)

How are the 100 billion nerve cells in the human brain connected? How do nerve cells communicate with each other – and why does this change in diseases such as Alzheimer's and epilepsy? How do nerve cells give rise to thoughts, emotions and actions? Neuroscience seeks to answer questions such as these. Some modules focus on normal function, others on disease processes and opportunities for treatment. All of the modules draw on the research undertaken by our staff, a feature which ensures students can engage with the very latest work in the field.

Pharmacology and Therapeutics

EXETER (ST LUKE'S AND STREATHAM CAMPUSES)

Study how drugs are designed and how they work in the body. Become familiar with research and development in the new generation of 'smart' drugs and how they are being targeted for specific subset of disorders.



THE RESEARCH INNOVATION LEARNING AND DEVELOPMENT (RILD) LABS

MSci Medical Sciences (Human Genomics) (EXETER)

B200 4 yrs

AAB-ABB | IB: 34-32 | BTEC: DDD-DDM

Required subjects: At least one grade A and one grade B in GCE AL science subjects, one of which must be Biology; at least one HL6 and one HL5 in IB science subjects, one of which must be Biology.

- Specialise in the discipline of Human Genomics by opting for the Human Genomics pathway or enrolling in our new 4-year MSci programme
- Study genes, their action and how they are passed on through generations
- Learn how powerful technologies in genomics allow us to sequence a person's entire genetic code: the genome, providing insight into normal function, as well as the identification and diagnosis of disease
- Help contribute to the latest research in human/medical genomics and gain higher level insight into bioinformatics, ethics and counselling, new generation sequencing, genetics of cancer and infectious diseases, and epigenetics by studying modules and carrying out research at Masters level

Year 1 Same content as BSc Medical Sciences.

Year 2, Year 3 and Year 4 Please refer to our website for the most up-to-date module information.

MSci Medical Sciences (Environment and Human Health) (EXETER AND TRURO, CORNWALL)

B300 4 yrs

AAB-ABB | IB: 34-32 | BTEC: DDD-DDM

Required subjects: At least one grade A and one grade B in GCE AL science subjects, one of which must be Biology; at least one HL6 and one HL5 in IB science subjects, one of which must be Biology.

- Take a transdisciplinary, holistic view investigating the intricate links between the environment and our health
- Spend your third and fourth year of the programme at our Cornwall campuses studying specialised modules in areas that include: global health, living with environment change, complexity of human societies, research methodology and climate change
- Study the latest published research in environmental influences on human health, disease and wellbeing, and how humans contribute to environment changes for the worse or better
- Contribute to the latest research in specific aspects of environment and human health by tackling questions such as antibiotic resistance and the quest for new sources of antibiotics in nature

Year 1 Same content as BSc Medical Sciences.

Year 2, Year 3 and Year 4 Please refer to our website for the most up-to-date module information.



MODULES

KEY C = Core
● = Optional

Year 1 Modules

Module Name	
Fundamental Skills for Medical Scientists	C
Biochemistry	C
Genetics	C
Integrated Human Physiology	C
Microbiology	C
Cells	C
Academic and Professional Support	C [▲]

Year 2 Modules

Module Name	
Disease, Diagnostics and Therapeutics	C
Principles of Medical Research	C
Academic and Professional Support	C
Medical Research Evaluation	●
Anatomical Sciences	●
Immunopathology	●
Medical Genetics	● [†]
Foundations in Neuroscience	●◇
Introduction to Pharmacology	●◆
Ethical Issues in Health Research	●■
Introduction to Health Research	●■
Measurement and Evaluation in Health Research	●■
Medical and General Microbiology	●
Advanced Cell Biology	●
Molecular Biology of the Gene	●
Genomics and Introductory Bioinformatics	●
Molecular Microbiology	●
Academic and Professional Support	C [▲]

[†] Core for Genomics pathway.

◇ Core for Neuroscience pathway.

◆ Core for Pharmacology pathway.

■ Core for Health Research pathway.

▲ Core but non-credit bearing.

Professional Training Year (PTY) optional competitive entry

Module Name	
Professional Training Year	C
Academic and Professional Support	C [▲]

Final Year Modules

Module Name	
Translational Medical Science	C
Research Project	C
Academic and Professional Support	C
Psychology Applied to Health	●
Managing Clinical Trials: Putting Science into Practice	●
Pharmacogenomics	●
Rational Drug Design	●◆
Medical Genetics	● [†]
Frontiers in Neuroscience	●◇
Neuropharmacology	●
Health Economics	●
Medical Imaging: Principles and Applications	●
Rehabilitation Science	●
Health Technology Assessment	●
Pharmacology and Medicinal Chemistry	●
Cellular Basis of Immunity	●
Molecular Basis of Infection	●
Cell Biology of Disease	●
Bioinformatics	●
Academic and Professional Support	C [▲]



Please note that the modules described relate to the core BSc (Hons) Medical Sciences programme. If you study one of our pathways or an MSci, core and optional modules will differ slightly after Year 1. Refer to our website for the most up-to-date module information.

YEAR I

In your first year you will explore the science that underpins the advancement of modern medical practice. The emphasis is on understanding the normal functioning of the human body, from enzymes through to whole biological systems. This is supplemented by the study of environmental micro-organisms and human microbiome and how they may benefit or alter our health. Without this core knowledge of how the body works, it would be impossible for us, as scientists, to devise the new preventative or diagnostic tests, drugs or treatments that will best benefit patients.

Alongside lectures, tutorials and laboratory practicals, you will engage in student-centred small group work where you are given the freedom to explore a scientific topic under the expert guidance of one of our tutors. Further tutor-guided learning occurs within our Life Sciences Resource Centre, supported by state-of-the-art technology-enhanced learning resources. Your core laboratory skills will be developed through laboratory-based practicals that run alongside and support your other sessions. Some inspirational sessions also involve a doctor, scientist and patient to explore key clinical cases from three different perspectives.

You will begin to compile your Personal Development and Professionalism Portfolio, in which you chart your progress from a new student to a professional individual ready for the world of employment. You'll do this by analysing your academic performance and the frequent feedback offered by the school to identify opportunities for personal and professional development to help you achieve your educational and career goals. Support for your academic progress, employability and career planning is provided by your allocated Academic Tutor and through various workshops and training sessions which are embedded in core modules called Academic and Professional Support.

Core modules:

Fundamental Skills for Medical Scientists

Introduces the underlying concepts required for scientific investigation, including modern laboratory techniques, experimental design and presenting scientific data. Particular emphasis is given to learning the quantitative skills required to analyse experimental results. Team development training and small group tutorial work are features of this module.

Biochemistry

Life is driven by biochemical reactions. Biochemistry is an introductory module providing the essentials for understanding all living processes. You will study protein structure, enzyme kinetics and basic metabolism; understanding how each of these processes function and shape the living cell. Practical sessions offer you vital hands-on experience, learning key techniques and how to apply them.

Genetics

Genetics is fundamental to understanding life sciences. In this module you will gain an understanding of how information is stored and inherited in living organisms. You will consider genetics from the perspectives of DNA structure, gene expression, genome replication, heredity, genes in populations, and evolution. Modern techniques in DNA sequencing and the exploration of gene diversity will be introduced, with examples from humans and other organisms. In laboratory practicals you will prepare and analyse your own DNA, testing the Out-of-Africa hypothesis of human evolution.

Microbiology

This core module provides an introduction to the microbial world. Essentially divided into two parts, concepts and skills, this module will introduce these through lectures and practical sessions. The core concepts are focused around five key themes which are: evolution, information flow, metabolic pathways, structure and function and the impact of micro-organisms. Micro-organisms, including bacteria, protists and fungi, will be used to highlight these concepts. You will thus be introduced to a variety of biological concepts, ranging from an evolutionary perspective through to modern day Medical Microbiology.

Cell

This module takes you on a trip around the fundamental unit of life – the cell. With particular emphasis on its dynamic nature, and using examples from bacteria to plants to animals, you will learn how cells use membranes and proteins to organise themselves, and how they communicate both within and without their confines. It also considers the guiding principles that govern formation of a multicellular organism such as cell division and tissue development.

Integrated Human Physiology

This core module provides an introduction to the science that underpins human health; from cells through to systems that regulate everyday functions. You will explore the modules content through a variety of different teaching formats including working in small groups with a facilitator, larger group seminars and supporting lectures. You will explore the core concepts of human physiology with some examples of diseases in order to underpin your understanding of the normal physiology that controls the internal environment of the human body.

YEAR 2

The second year focuses on the scientific basis of important diseases, beginning with some fundamental insights into the ways in which human biology goes awry in disease. This knowledge is then used to explore how cutting-edge scientific technologies can be exploited to advance disease diagnosis and treatment. Within a variety of learning environments, including lectures, tutorials, workshops, laboratory practicals and small group learning, you will have opportunities to investigate and debate how disease develops and how healthcare can be improved. Key aspects of applied research are explored including clinical research methods and its design and setting within healthcare environments. Your understanding of these areas develops through a variety of hands-on learning opportunities which enhance your practical research skills and knowledge of contemporary medical research issues. You'll continue to develop your academic professionalism and if you plan to undertake the Professional Training Year placement, you'll be supported in making your application. These activities are embedded in the core module called Academic and Professional Support.

Core modules:

Disease, Diagnostics and Therapy

This module examines current knowledge of key pathophysiological mechanisms that underpin human disease, alongside key techniques used in the diagnosis, monitoring and treatment of disease. Small group learning and structured supporting sessions are used to provide scientific 'trigger' scenarios that introduce key transferable concepts within the setting of illustrative important diseases.

Principles of Medical Research

The best research blends knowledge, skill and inspiration; this module combines all three and will unlock your research potential. Working wherever possible in small groups and hands-on, we begin with an historical and philosophical perspective. We then consider experimental design, explore how critical thinking supports discovery and see why ethics matter. You'll then have a chance to put all this into practice by designing, conducting and analysing your own research project.

Optional modules. You can select two from the following:

Medical Research Evaluation

Working both individually and as part of a research team, this module develops your critical research enquiry and analytical skills. It consolidates your growing skills in collection, interpretation and presentation of research evidence in a variety of cutting-edge scientific areas. With the assistance of your personal tutor you will also develop your academic skills and professional aptitudes in leadership, teamwork and communication.

Anatomical Sciences

This module will allow you to implement your anatomy knowledge and relate it to physiology and pathologies through the discovery of current or past anatomy breakthroughs according to your interest. Using this knowledge you will explore the key concepts and principles that underpin human diseases, learn about research methods and explain the basis of diseases and scientific discoveries of your choice. Additionally, we aim to develop new teaching tools for the life science resource centre using current anatomy models.

Immunopathology

In this module you will explore how your immune system is vital for protection from disease. Immunology is also fundamental for preventing the spread of disease, through vaccination, as well as treating infectious conditions, autoimmune diseases and even cancer. You will learn to identify the major components of the immune system and how they relate to diseases which have major global impact, such as malaria. You will also recognise how immunology has been exploited for the development of therapeutics (such as monoclonal antibodies) and for diagnostic assays.

Medical and General Microbiology

This module explores the relationship of the microbial world with our environment and ourselves. Microbial infective potential and the human response to infection form a large portion of this module. Specific examples of disease-causing organisms and disease processes are explored. This module is supported by guest lectures from active researchers and lecturers within medicine and from a veterinary school. The practical classes will train you in the aseptic techniques which are essential skills for safe working practice within microbiology.

Advanced Cell Biology

This module builds on the first year module, Microbiology and Cells, focusing on processes such as maintenance of cell shape, cell division, cell motility and autophagy, and the regulation of these processes, to provide you with an understanding of the complex spatio-temporal organisation required for cell function.

Molecular Biology of the Gene

This module aims to develop a core understanding of molecular biology and genetics. It will cover a range of topics including: genome structure, organisation and packaging; genome replication and repair; the process of gene expression through transcription, RNA processing and translation; protein sorting and modification; regulation of gene expression. Molecular detail and examples will be drawn from both prokaryotes and eukaryotes.

Genomics and Introductory Bioinformatics

This module considers concepts, techniques and applications of genomics and the bioinformatics methods that support them. The module will focus on state-of-the-art technology for analysis of genomes and gene expression and critically discuss their use in biological research. Practical classes will consolidate use of internet-based bioinformatics tools and databases through individual and group project work, and presentations will provide a platform to critically discuss case studies.

Molecular Microbiology

You will gain an understanding of the molecular mechanisms that underlie the growth and survival of microbial species in diverse environments, their ability to cause disease in relevant hosts, and their ability to resist antimicrobial agents. This module will also consider molecular methods that can be applied to the study of microbes, and how those methods impact on our understanding of human-microbial interactions during health and disease. Additionally, this module will provide practical training in molecular microbiology methods.

Medical Genetics (core to Human Genomics pathway)

This module aims to give you an insight into how and why genetics is important in the diagnosis and treatment of disease and also to understand the role of genetics in elucidating biological processes. You will focus first on the basics of how genetic material is replicated and curated. Secondly, you will focus on how sequence changes can lead to genetic disease, or susceptibility to complex diseases. Following this, you will explore the molecular mechanisms by which genes are regulated and the contribution of the environment, and finally you will concentrate on the ethical implications of this for families and individuals.

Foundations in Neuroscience (core to Neuroscience pathway)

The human brain is the most complex object in the known universe. Through its function, and that of the wider nervous system, we are able to respond to environmental stimuli and, through learning, to construct hypotheses about the world around us. These hypotheses – and many other aspects of our conscious experience – may then be shared through external communication. To begin your detailed exploration of these processes, this module introduces functional neuroanatomy, considers some key features of molecular cell biology, and describes synaptic transmission. The basic biological concepts will be illustrated using practical elements and clinical examples from neurological disorders.

Introduction to Pharmacology (core to Pharmacology and Therapeutics pathway)

Students on this module will develop an understanding of the fundamental concepts behind pharmacology and pharmacotherapy as the basis for disease treatment. The basic principles of pharmacokinetics, pharmacodynamics and drug metabolism will also be discussed. Throughout, the module will provide examples of licenced drugs used in treatment of disease in order to underpin and provide context to the major concepts and principles of pharmacology.

Introduction to Health Research (core to Health Research pathway)

Research is essential for good human health and informs every aspect of clinical practice, social care, and public policy. This module will introduce you to the fundamentals of health research, including quantitative and qualitative research methods, basic statistical analyses, the publication and dissemination of research findings, patient and public involvement, and the interconnection between research funding, public policy and clinical practice. This module will focus specifically on research that is conducted with human participants.

Ethical Issues in Health Research (core to Health Research pathway)

Some of the most ground-breaking research in the history of human health has also been some of the most unethical. Research that has led to breakthroughs in psychology, cancer, polio, cloning, and extreme medicine, just to name a few, would not be allowed to be conducted today. This module will introduce you to key ethical issues in health research. Through a mix of lectures and structured small group learning (SSGL), you will be introduced to essential ethical concepts in human health research, including consent, confidentiality, deception, and coercion; consider the influence of publication bias, reimbursement for research participants, and the involvement of Big Pharma and the military in health research; explore the challenges of conducting research with vulnerable populations; and investigate ethics in the age of social media.

Measurement and Evaluation in Health Research (core to Health Research pathway; must be taken with Introduction to Health Research)

Rigorous measurement and evaluation are at the heart of good research. They are also the key to ensuring that research leads to evidence-based clinical practice. This module will introduce you to the fundamentals of measurement and evaluation, including the design and testing of new measures, evidence synthesis, and cost-effectiveness. This module will focus specifically on research that is conducted with human participants.



LAB TESTING, RILD

FINAL YEAR

In your final year you have opportunities to study and undertake research to help improve current medical knowledge and practice. In addition to the core modules, you can select from a range of optional specialist advanced modules, enabling you to tailor your degree to match your own specific interests and career ambitions.

You'll look at authentic and complex clinical case scenarios and, working as a team, you'll apply evidence-based scientific theory and explore emerging new health technologies to help improve patient health and advance fundamental understanding of pathologies. During this year, you will undertake a clinical/research project, closely supervised by an expert research professional.

You'll also complete your Personal Development and Professionalism Portfolio. Support will be provided to help you consider your career options and help consolidate your CV and interview technique within the Academic and Professional Support module.

Core modules:

Translational Medical Science

Continuing on from the first and second year modules, you'll apply critical appraisal of technological advances, scientific discoveries and published research to contemporary healthcare problems, thereby illustrating how science translation advances current clinical practice. Major areas of translational science such as genetics, diabetes, immunology and neuroscience will be explored within extensive medical and clinical contexts.

Final Year Research Project

In this module you'll have an opportunity to undertake your own independent and original piece of clinical research under expert staff supervision. Research projects deal with questions and issues at the cutting-edge of medical, clinical, health or environmental sciences developments. You'll design the research project, collect and analyse data and then write up the results. In addition, the module will also enhance your future employability by consolidating your personal and professional skills.

Optional modules. You can select three from the following:

Psychology Applied to Health

Health and illness are not only influenced by biological factors (viruses, bacteria, etc), but also by psychological and social factors, including emotions, personality, and our relationships with other people. Understanding the interplay between these different influences is critical to medical research and clinical practice. Students on this module are introduced to contemporary research in key areas of psychology applied to health (including stress, social support, medication adherence), and will study how research findings are translated into practice in healthcare settings.

Managing Clinical Trials: Putting Science into Practice

This module explores the key scientific principles underpinning the successful design, implementation and monitoring strategies associated with a new clinical technology trial. You will gain a thorough understanding of the key principles that influence new clinical trial design; including but not limited to the role of diagnostic biomarkers, the development of complex interventions and the role of health prevention.

Pharmacogenomics

In this module you will cover the basic concepts of pharmacogenomics and relate these to current clinical practice where appropriate. Additionally you will have the opportunity to study in depth examples of individualised therapy in diseases such as cancer, cystic fibrosis and diabetes. You will also consider the introduction of genetic testing for new pharmacogenomic discoveries taking into account analytical and clinical validity, clinical utility and ethical aspects.

Neuropharmacology

The nervous system is central to the regulation of all aspects of physiology and behaviour. In this module you will learn how altering nervous system signalling using drugs leads to changes in physiology and behaviour with beneficial or detrimental consequences for human health. You will investigate why some substances historically used as therapeutics have also been co-opted for 'recreational' use and will develop an understanding of the associated complexities. Particular consideration will be paid to possible side effects and the molecular mechanisms underlying the development of drug dependence and tolerance.

Health Economics

The module will introduce the basic principles of economics analysis in health care and the tools used in health economics. It will provide information on the underlying concepts of scarcity and choice, opportunity cost, demand and supply for healthcare, supplier-induced demand, efficiency and equity; will consider the processes of healthcare financing and health insurance. It will emphasise the use of different approaches to economic evaluation and valuation of health benefits for assessing healthcare interventions as a way of making informed decisions in terms of costs and benefits. Finally, it will describe priority setting and equity on health.

Health Technology Assessment (must be taken with Health Economics)

The module is designed for students who wish to develop skills and knowledge in Health Technology Assessment (HTA), the process of evaluating costs and health benefits associated with health technologies such as pharmaceuticals, medical devices and diagnostic tests. This module covers key elements and methods of HTA such as clinical evidence synthesis and economic evaluation. The module is research-inspired – you will learn directly from members of Peninsula Technology Assessment Group (PenTAG) who have first-hand experience in HTA decision-making at the national level through the National Institute for Health and Care Excellence (NICE).



Medical Imaging: Principles and Applications	This module provides an understanding of the key scientific principles and clinical research applications of current and emerging innovations in medical imaging. Medical imaging uses ionising and non-ionising radiation in order to visualise anatomical structures and physiological processes, diagnose and treat pathologies, monitor disease progression and the effects of therapeutic interventions.	Bioinformatics	Research in the biological sciences is increasingly dependent on large datasets such as those generated by DNA sequencing and microarrays. This is also true for diagnostics and medicine. Analysis of these datasets requires a range of skills and knowledge drawn from computer science, physical sciences, and mathematics and statistics as well as biological sciences. Bioinformatics is the discipline that integrates algorithms and methods from these disciplines to model biological systems and infer patterns hidden in complex data.
Rehabilitation Science	Rehabilitation is the process by which someone with a disability, injury or illness is 'helped to acquire knowledge and skills in order to maximise physical, psychological and social function' (Barnes & Ward, 2000). The module will focus on modern rehabilitation practice which emphasises a client or patient centred approach and recognises the importance of involving family, relatives, caregivers and friends.	Rational Drug Design (core to Pharmacology and Therapeutics pathway)	This module explores the biological basis of rational drug design, the deliberate targeting of a particular biological pathway for the treatment of disease. This approach is based on knowledge of the pathophysiology of the disease in question and identification of a suitable molecular target. Targeted drug design also has implications for the personalisation of medicine, through selection of appropriate drugs/therapies for a particular patient based on the molecular signature of their disease. You will follow the journey of drug discovery from identification of a potential new drug target (through study of genetics, epigenetics or cell biology), through approaches taken to test and modify both pharmacokinetic values and biological activity, including chemical group substitution, structure-based drug design, and drug formulation and route of administration.
Pharmacology and Medicinal Chemistry	This module offers you an insight into the design of drug molecules, the biological macromolecules they are designed to target and their mode of action. It covers a broad area of the subject from the chemical design to allow molecules to get to their target in the human or bacterial cell, the biological targets and mode of action and their medical application. Lectures will include external speakers who are working at the forefront of this area in industry and in the medical profession. It will be an invaluable experience for those wanting to pursue a career in medicine or medically-related research, the pharmaceutical or biotechnology industries.	Medical Genomics (core to Human Genomics pathway)	It is now feasible to sequence the entire genome of an individual in just a few weeks, for less than £1,000. A step change in technology has enabled the interrogation of whole genome data on a relatively routine basis for the first time. The interpretation of these genomic data is the focus of this module, with particular emphasis on the application of genomics to medical scenarios. You will gain practical hands-on experience of the data available, how it is generated and how it can be used for patients' benefit.
Cellular Basis of Immunity	This module introduces you to the science of immunology. Key components of the immune system are explored and current research topics are used to illustrate how antibodies are engineered and used in the diagnosis and prevention of diseases in contemporary medicine and agriculture.	Frontiers in Neuroscience (core to Neuroscience pathway)	This module focuses on the neurobiology of disorders of the nervous system. Specifically, the module explores the ways in which recent work has answered some questions about the operation of the nervous system, yet also posed new questions. In particular the module highlights the potential for further progress in deciphering and repairing neural circuitry by considering some of the reasons effective treatments for many neural disorders remain elusive. The module focuses on seven important disorders of the nervous system, using these to understand both pathology and normal physiology. The course is delivered by leading experts working in each of these disorders and will allow students to work with these researchers to identify key outstanding questions in neuroscience and formulate a literature review to investigate your chosen disease area.
Molecular Basis of Infection	Both bacterial and fungal pathogens pose a significant threat to our health and that of the agricultural crops upon which we depend. In this module we will explore the strategies adopted by pathogens that allow them to gain entry into a host and survive within the host environment. You will gain insight into how disease might be controlled in the future through evaluating the molecular basis of pathogenicity.		
Cell Biology of Disease	This module aims to elucidate the underlying molecular and cellular alterations in various forms of disease with particular emphasis on cellular dynamics, the cytoskeleton and organelle function. The emphasis is on the underlying cell biology and molecular defects of various disorders which are linked to alterations of the cytoskeleton and intracellular motility, neurodegeneration such as in Alzheimer's or Huntington's disease, pathogen/parasite invasion, protein sorting, organelle biogenesis and metabolism, and deregulation of mitosis in cancer.		

BSc SPORT AND EXERCISE MEDICAL SCIENCES



Taught jointly by the University of Exeter Medical School and the Department of Sport and Health Sciences, this programme blends an understanding of the pathology, prevention and treatment of acute or chronic disease/injury, alongside an insight into the science underpinning the optimal preparation, performance and rehabilitation of the athlete or healing patient. The combination of medical sciences and sport and health sciences enables you to develop a holistic understanding of the human body and exercise and physical activity. The four-year version, with Professional Training Year (PTY), offers you the opportunity to undertake a relevant work placement with an employer within the health sector or another appropriate sector in between your second and final year.

The programme responds to a growing public health agenda which seeks to prevent disease and treat targeted disorders through appropriate physical activity, lifestyle-related health behaviours and nutrition. It provides a broad range of career opportunities particularly within medical sciences, rehabilitation, sport science, health and wellbeing sectors. On graduation, you will be well positioned to support the preparation and rehabilitation of athletes, with patients recovering from injury or illness, and to undertake roles aimed at improving lifestyle through increasing levels of sport and exercise in the population at large. You will also be well placed to pursue further postgraduate study in, for example, Sport and Exercise Medicine, Medicine, Physiotherapy, Occupational Therapy, Sports Nutrition and Nursing.

The first part of the programme gives you a wide-ranging insight into how the human body normally works. We study this through small group sessions, lectures and hands-on laboratory practicals. We then build upon this foundation to see how things can go wrong in the body due to disease or sport/exercise injury and how normal function might be restored. We are keen that you develop a holistic understanding of human health.

For example, whilst pharmaceutical intervention may be appropriate in some conditions, others might be helped more by using technology or engineering. You will be able to see this for yourself, thanks to the wide range of placements that run throughout the programme.

The longest of these placements is the PTY in the third year, when many students take the option to spend a whole year working in industry, the sports and exercise environment or a university or NHS laboratory. Whether you chose to do the three or four-year programme, your final year will be spent specialising in the area that interests you most. You'll also undertake a two-term independent research project under the supervision of an academic.

SINGLE HONOURS

BSc Sport and Exercise Medical Sciences (EXETER)

BC03 3 yrs

with Professional Training Year BC04 4 yrs
AAA-AAB | IB: 36-34 | BTEC: DDD

Required subjects: GCE AL Biology grade B and another science at grade B; IB Biology HL5; and second science HL5.

- Our Sport and Exercise Medical Sciences programme benefits from the education and research expertise of two disciplines: Medical Sciences and Sport and Health Sciences. It blends an understanding of the normal physiology, pathology, prevention and treatment of acute disease/injury, with the science underpinning the optimal preparation, performance and rehabilitation/recovery of the athlete or healing patient
- Explore the interplay between the two disciplines, and choose from a range of modules to best tailor your career outlook
- Optional competitive PTY placements in a field in line with your scientific interests and relevant to your postgraduate training

Year 1 Your first year will develop your existing knowledge and understanding of the functions of the human body. This will be supplemented with training in basic laboratory, research and study skills.

Year 2 This year builds your knowledge, skills and professional aptitudes by reflecting on your previous year's portfolio of achievements and feedback received from tutors and assessments. Core modules focus on mechanisms, treatment and diagnosis of disease and an introduction to the medical research process. You will apply your developing research skills to designing, running, analysing and reporting on your own research project. You can specialise in particular areas of medical or sports science or retain a broad focus to your degree by choosing from a range of optional modules.

Year 3 You have the option of completing our popular, career-inspiring PTY. This is a research placement year in which you will gain firsthand experience of a research environment and develop your employment-focused transferrable skills.

Final Year In the final year you will apply your previous training to an independent research project by working with world-leading health, medical or clinical researchers within the Medical School. This project may involve data collection or the analysis of existing data and will require you to understand and review published scientific literature.

MODULES

KEY C = Core
● = Optional

Please note that the modules listed relate to the core BSc (Hons) Sport and Exercise Medical Sciences programme. Refer to our website for the most up-to-date module information.

Year 1 Modules

Module Name	
Foundations of Biomechanics	C
Sports Training Physiology	C
Foundations of Nutrition and Metabolism	C
Foundations of Exercise and Sport Psychology	C
Integrated Human Physiology	C
Fundamental Skills for Medical Scientists	C
Academic and Professional Support	C [▲]

Year 2 Modules

Module Name	
Biomechanics and Kinesiology	C
Sport Psychology	C
Disease, Diagnostics and Therapeutics	C
Principles of Medical Research	C
Exercise Physiology	C
Strength and Conditioning Physiology	●
Sports Nutrition and Metabolism	●
Skill Acquisition	●
Medical Research Evaluation	●
Foundation in Neuroscience	●
Introduction to Pharmacology	●
Medical Genetics	●
Immunopathology	●
Anatomical Sciences	●
Academic and Professional Support	C [▲]

[▲] Core but non-credit bearing.

Professional Training Year (PTY) optional competitive entry

Module Name	
Professional Training Year	C
Academic and Professional Support	C [▲]

Final Year Modules

Module Name	
Dissertation or Research Project	C
Medical Imaging – Principles and Applications	●
Rehabilitation Science	●
Biomechanical Analysis of Human Movement	●
Clinical Exercise Prescription	●
Employability and Career Development	●
Physiological Determinants of Exercise Performance	●
Integrated Physiology and Adaption to Physical (in)Activity	●
Paediatric Exercise Physiology	●
Sport, Physical Activity and Health	●
Sport Psychology	●
Medical Genomics	●
Pharmacogenomics	●
Rational Drug Design	●
Neuropharmacology	●
Psychology Applied to Health	●
Health Economics	●
Academic and Professional Support	C [▲]



I chose Exeter initially due to the unique degree that it offered, which combined my main two academic interests; sport and medical sciences. Because of the blend of the two courses, you obtain a greater understanding of the human body, both from a performance element, and a more scientific approach.

The course itself is unlike any in the country, and due to the added skillset from the programme combination, the range of graduate jobs/opportunities is far greater than that of just doing one of the courses. We also have the opportunity to do the Professional Training Year (PTY) in industry, which is unlike other courses. We are very lucky at Exeter to have such a fantastic reputation for research, and as sciences students we are encouraged to get involved with PhD or Masters projects, as well as the PTY.

Laura, studying Sport and Exercise Medical Sciences



YEAR I

Core modules:

Foundations of Biomechanics

The study of force and motion form a large part of the sport and exercise curriculum and this module will provide you with a grounding in how to analyse these aspects from a biomechanical perspective. You will learn about different methods of assessing linear movements and forces in sports, developing your understanding of linear kinematics and linear kinetics. This module will then help you to apply these principles to the analysis of human movement and performance in sports and to understand injury risk. There are no pre- or co-requisites for this module and it is suitable for non-specialist students who have studied some science at A level or equivalent.

Sports Training Physiology

This module will provide you with an overview of physiological mechanisms that underpin training adaptations and subsequent sporting performance. You will gain an appreciation of the principles of training and how practitioners design training programmes to improve endurance, speed endurance, speed, flexibility/agility, and strength/power performance for athletes and recreational participants. You will develop knowledge of the different fitness demands of various sports as well as an understanding of overtraining, field-testing methods used to assess sporting performance, and recovery strategies. There are no pre- or co-requisites for this module and the module is suitable for non-specialist students who have studied related topics.

Foundations of Nutrition and Metabolism

This module will provide you with the knowledge and basic practical skills to begin to make you informed about nutrition and metabolism. You will cover the metabolism of macronutrients and begin to understand how they interact in various sporting situations. Furthermore, there will be nutritional basics related to health and sport including injury and weight management. You will begin to make judgements of nutritional research from both a health and performance perspective. There are no pre- or co-requisites for this module and the module is suitable for non-specialist students who have studied science at A level or equivalent.

Foundations of Exercise and Sport Psychology

Psychology is an increasingly important aspect of sport and exercise science. This module will provide you with a foundation in the topics and theories surrounding this interesting area. You will cover topics such as personality, motivation, stress and group dynamics, examining their role within both sport performance and exercise participation. You will also cover more contentious and challenging issues such as injury, addiction, substance abuse and overtraining. This module will introduce you to psychological skills training and highlight interventions, such as goal setting, that are adopted by sport and exercise psychologists to improve performance and increase participation.

Integrated Human Physiology

This core module provides an introduction to the science that underpins human health; from cells through to systems that regulate everyday functions. You will explore the modules content through a variety of different teaching formats including working in small groups with a facilitator, larger group seminars and supporting lectures. You will explore the core concepts of human physiology with some examples of diseases in order to underpin your understanding of the normal physiology that controls the internal environment of the human body.

Fundamental Skills for Medical Scientists

Introduces the underlying concepts required for scientific investigation, including modern laboratory techniques, experimental design and presenting scientific data. Particular emphasis is given to learning the quantitative skills required to analyse experimental results. Team development training and small group tutorial work are features of this module.



YEAR 2

Core modules:

Biomechanics and Kinesiology

This module builds upon the Foundations of Biomechanics core module and introduces methods for analysing angular motion. Through the development of an understanding of angular kinematics and angular kinetics, you will become familiar with approaches for analysing human movement in sports and exercise, both for improving sports performance and for reducing the incidence of injury. You will gain experience of obtaining data in a laboratory setting and apply these data to identify factors influencing performance and/or injury.

Sport Psychology

On this module you will learn about identifying and assessing factors that may affect performance and well being in sport. Coupled with a critical understanding of sport psychology theories, you will then be able to describe what could be done to enhance performance, studying a variety of techniques from goal-setting to imagery.

Disease, Diagnostics and Therapeutics

This module examines current knowledge of key pathophysiological mechanisms that underpin human disease, alongside key techniques used in the diagnosis, monitoring and treatment of disease. Small group learning and structured supporting sessions are used to provide scientific 'trigger' scenarios that introduce key transferable concepts within the setting of illustrative important diseases.

Principles of Medical Research

The best research blends knowledge, skill and inspiration; this module combines all three and will unlock your research potential. Working wherever possible in small groups and hands-on, we begin with an historical and philosophical perspective. We then consider experimental design, explore how critical thinking supports discovery and see why ethics matter. You'll then have a chance to put all this into practice by designing, conducting and analysing your own research project.

Exercise Physiology

This module builds on the knowledge gained of exercise physiology during Stage 1 to explore the body's responses to acute and chronic exercise. During this broad module you will learn theories pertaining to aerobic and anaerobic performance, cardiovascular and ventilatory responses to exercise, the regulation of exercise intensity, exercise at altitude, body composition and physical activity, and the impacts of aging and disease on physiological function. This module includes laboratory sessions to develop your practical skills and knowledge required to assess a selection of the above factors. During the course of this module, you will develop your ability to engage in critical commentary and raise your awareness of differing theoretical standpoints within this area.

Optional modules. You can select one from the following:

Skill Acquisition

You will be introduced to a field of psychology that can be applied to a range of health and performance domains; namely motor skill acquisition. You will cover the key psychological theories and models relating to skill acquisition and develop an understanding of how theoretical knowledge is used to guide applied practice.

Strength and Conditioning Physiology

This module seeks to provide you with the physiological knowledge and basic practical skills to make you an informed and competent practitioner of strength, conditioning and athletic training. You will cover the physiological responses to many aspects associated with strength, conditioning and athletic training and in addition cover the role of protein supplementation, the debate surrounding anabolic steroids, the science of SAQ training and overtraining. This module will also teach you the basics of functional assessment, planning and delivering of sports specific testing and Olympic lifting in a safe and suitable way. There are no pre- or co-requisites for this module.

Sports Nutrition and Metabolism

Nutrition is currently a very popular subject in relation to the enhancement of exercise and sports performance, in part because of the power of the advertising surrounding these products. However, for many of these nutritional products there is little if any empirical evidence to support their performance enhancing effects. You will learn to critically evaluate dietary advice and nutritional products related to optimising sports performance and training, including topics such as carbohydrate manipulation, protein supplementation, nutritional supplements such as caffeine, β -alanine, antioxidants and polyphenols. You will be able to assess nutritional intake and then suggest practically how diets can be manipulated. On this module you will conduct investigations to test the claims associated with a number of nutritional ergogenic aids such as carnitine, and blueberries. The Stage 1 module, Nutrition and Metabolism (ESS1606) is a pre-requisite.

Anatomical Sciences

This module will allow you to implement your anatomy knowledge and relate it to physiology and pathologies through the discovery of current or past anatomy breakthroughs according to your interest. Using this knowledge you will explore the key concepts and principles that underpin human diseases, learn about research methods and explain the basis of diseases and scientific discoveries of your choice. Additionally, we aim to develop new teaching tools for the life science resource centre using current anatomy models.

Immunopathology	<p>In this module you will explore how your immune system is vital for protection from disease. Immunology is also fundamental for preventing the spread of disease, through vaccination, as well as treating infectious conditions, autoimmune diseases and even cancer. You will learn to identify the major components of the immune system and how they relate to diseases which have major global impact, such as schistosomiasis. You will also recognise how immunology has been exploited for the development of therapeutics (such as monoclonal antibodies and cancer immunotherapy) and for diagnostic assays.</p>
Medical Research Evaluation	<p>Working both individually and as part of a research team, this module develops your critical research enquiry and analytical skills. It consolidates your growing skills in collection, interpretation and presentation of research evidence in a variety of cutting-edge scientific areas. With the assistance of your personal tutor you will also develop your academic skills and professional aptitudes in leadership, teamwork and communication.</p>
Foundations in Neuroscience	<p>The human brain is the most complex object in the known universe. Through its function, and that of the wider nervous system, we are able to respond to environmental stimuli and, through learning, to construct hypotheses about the world around us. These hypotheses, and many other aspects of our conscious experience, may then be shared through external communication. To begin your detailed exploration of these processes, this module introduces functional neuroanatomy, considers some key features of molecular cell biology, and describes synaptic transmission. The basic biological concepts will be illustrated using practical elements and clinical examples from neurological disorders.</p>
Introduction to Pharmacology	<p>Students on this module will develop an understanding of the fundamental concepts behind pharmacology and pharmacotherapy as the basis for disease treatment. The basic principles of pharmacokinetics, pharmacodynamics and drug metabolism will also be discussed. Throughout, the module will provide examples of licenced drugs used in treatment of disease in order to underpin and provide context to the major concepts and principles of pharmacology.</p>
Medical Genetics	<p>This module aims to give you an insight into how and why genetics is important in the diagnosis and treatment of disease and also to understand the role of genetics in elucidating biological processes. You will focus first on the basics of how genetic material is replicated and curated. Secondly, you will focus on how sequence changes can lead to genetic disease, or susceptibility to complex diseases. Following this, you will explore the molecular mechanisms by which genes are regulated and the contribution of the environment, and finally you will concentrate on the ethical implications of this for families and individuals.</p>



ST LUKE'S CAMPUS

FINAL YEAR

Core modules:

Dissertation or Research Project

In this module you'll have an opportunity to undertake your own independent and original piece of clinical research under expert staff supervision. Research projects deal with questions and issues at the cutting-edge of medical, clinical, health or environmental sciences developments. You'll design the research project, collect and analyse data and then write up the results. In addition, the module will also enhance your future employability by consolidating your personal and professional skills.

Optional modules. You can select up to three from the following:

Medical Imaging – Principles and Applications

This module provides an understanding of the key scientific principles and clinical research applications of current and emerging innovations in medical imaging. Medical imaging uses ionising and non-ionising radiation in order to visualise anatomical structures and physiological processes, diagnose and treat pathologies, monitor disease progression and the effects of therapeutic interventions.

Employability and Career Development

The opportunity to develop your employability skills and potential in your degree is paramount as you may soon be entering the job market. In this module, you will be guided through possible career paths and learn to identify employers' needs in a changing job market. Guest speakers and relevant practical sessions will help you to prepare for future employment. Topics covered include designing your CV, cover letter, the application process, improve your presentation skills, and interview techniques. As well as the practical sessions, you will do 40 hours of self-organised work experience, maximising your employability potential and giving you the chance to experience a particular career.

Paediatric Exercise Physiology

Children and adolescents are not simply 'mini-adults'. They are growing and maturing at their own rate, and consequently their physiological responses to exercise are profoundly different from adults. This module will explore the impact that growth and maturation has on physiological function and exercise performance, and equip you with the necessary skills to interpret data independent of body size. The benefits (eg, improved physical fitness) and risks (eg, impaired growth) of participating in physical activity will also be explored. The module benefits from past and on-going research from the Children's Health and Exercise Research Centre (CHERC).

Sport, Physical Activity and Health

Rather than focusing on individual sport performance, you will focus on participation in sport and physical activity (PA) at the population level. You will learn how to measure the association between sport, PA and health and will examine different methods for assessing participation levels in the population as a whole as well as sub-populations. You will work in small groups to develop an evaluation plan for assessing the effectiveness of interventions to promote sport and PA participation.

Integrated Physiology and Adaption to Physical (in)Activity

Particularly in Western society, the amount of time individuals spend physically active has declined considerably over the last century. It is becoming evident that decreased physical activity is the single biggest factor underlying or exacerbating many chronic diseases, (eg, type-2 diabetes, chronic heart disease, age-related sarcopenia). This module builds on fundamental physiology, metabolism and biochemistry to explain and critically assess the evidence for how our biology interacts with our environmental stimuli of exercise and inactivity to impact on health and performance.

Physiological Determinants of Exercise Performance

The principle objective of this module is to provide a detailed and critical review of the physiological factors that determine, and thus limit, exercise performance in humans. During the module you will analyse the factors related to peripheral and central fatigue that ultimately limit exercise performance across the duration-intensity spectrum. You will also critically examine the physiological mechanisms by which pacing strategies, ergogenic aids and training interventions (eg, traditional aerobic or resistance based training, high-intensity interval training, and blood flow restriction) can lead to improved exercise performance. You will also develop practical laboratory based data collection, handling and analysis skills during this module.

Clinical Exercise Prescription

The use of exercise as a treatment strategy is becoming increasingly advocated for a range of clinical conditions. This module will equip you with the ability to prescribe a safe, realistic and effective programme for an individual with a particular clinical condition by giving you an understanding of the aetiology of the condition and its effect on the exercise response. The module covers prescribing exercise for cardiac and pulmonary rehabilitation patients, alongside other conditions such as arthritis, obesity pregnancy and cancer. You will also receive a foundation in the practicalities of delivering a safe and effective exercise prescription.

Biomechanical Analysis of Human Movement

As well as building on knowledge gained in Years 1 and 2, this module will introduce the use of modelling techniques to estimate the loads experienced by structures of the human body. You will learn methods for combining kinetic and kinematic data to improve understanding of human movement. This module involves both theoretical and practical elements.



Sport Psychology	This module goes beyond the basic concepts and theories in sport psychology to develop an understanding of how to apply this knowledge in a real-world setting. The module will provide you with an understanding of contemporary developments in sport psychology. You will work from the scientist-practitioner model to understand how trait like individual differences, stress appraisal, and specific attitudes influence performance under pressure.	Rational Drug Design	This module explores the biological basis of rational drug design, the deliberate targeting of a particular biological pathway for the treatment of disease. This approach is based on knowledge of the pathophysiology of the disease in question and identification of a suitable molecular target. Targeted drug design also has implications for the personalisation of medicine, through selection of appropriate drugs/therapies for a particular patient based on the molecular signature of their disease. You will follow the journey of drug discovery from identification of a potential new drug target (through study of genetics, epigenetics or cell biology), through approaches taken to test and modify both pharmacokinetic values and biological activity, including chemical group substitution, structure-based drug design and drug formulation and route of administration.
Psychology Applied to Health	Health and illness are not only influenced by biological factors (viruses, bacteria, etc), but also by psychological and social factors, including emotions, personality, and our relationships with other people. Understanding the interplay between these different influences is critical to medical research and clinical practice. Students on this module are introduced to contemporary research in key areas of psychology applied to health (including stress, social support, medication adherence), and will study how research findings are translated into practice in healthcare settings.	Neuropharmacology	The nervous system is central to the regulation of all aspects of physiology and behaviour. In this module you will learn how altering nervous system signalling using drugs leads to changes in physiology and behaviour with beneficial or detrimental consequences for human health. You will investigate why some substances historically used as therapeutics have also been co-opted for 'recreational' use and will develop an understanding of the associated complexities. Particular attention will be paid to possible side effects and the molecular mechanisms underlying the development of drug dependence and tolerance.
Pharmacogenomics	In this module you will cover the basic concepts of pharmacogenomics and relate these to current clinical practice where appropriate. Additionally you will have the opportunity to study in depth examples of individualised therapy in diseases such as cancer, cystic fibrosis and diabetes. You will also consider the introduction of genetic testing for new pharmacogenomic discoveries taking into account analytical and clinical validity, clinical utility and ethical aspects.	Health Economics	The module will introduce the basic principles of economics analysis in healthcare and the tools used in health economics. It will provide information on the underlying concepts of scarcity and choice, opportunity cost, demand and supply for health care, supplier-induced demand, efficiency and equity; will consider the processes of healthcare financing and health insurance. It will emphasise the use of different approaches to economic evaluation and valuation of health benefits for assessing health care interventions as a way of making informed decisions in terms of costs and benefits. Finally, it will describe priority setting and equity on health.
Medical Genomics	It is now feasible to sequence the entire genome of an individual in just a few weeks, for less than £1,000. A step change in technology has enabled the interrogation of whole genome data on a relatively routine basis for the first time. The interpretation of these genomic data is the focus of this module, with particular emphasis on the application of genomics to medical scenarios. You will gain practical hands-on experience of the data available, how it is generated and how it can be used for patients' benefit.	Rehabilitation Science	Rehabilitation is the process by which someone with a disability, injury or illness is 'helped to acquire knowledge and skills in order to maximise physical, psychological and social function' (Barnes & Ward, 2000). The module will focus on modern rehabilitation practice which emphasises a client or patient centred approach and recognises the importance of involving family, relatives, caregivers and friends.

PROFESSIONAL TRAINING YEAR



I thoroughly enjoyed my Professional Training Year, and feel it taught me what it's actually like to 'do science' – it's a bit different to the text books! The PTY has also enhanced my employability; not only have I gained practical research experience, I've also greatly expanded my professional network and had an extra year to mature. I feel it has helped me stand out from the crowd of graduates in so many ways. I feel really well set up to work in a research environment through my time here and can't wait to start. I can't deny pulling myself away from Exeter has been tough though!

Oli, Medical Sciences graduate

If you choose to undertake a Professional Training Year (PTY), you will gain valuable experience of working within a professional clinical and medical research environment. You'll also further develop evidence-based analysis of your academic and professional experience throughout your placement. During your placement you are closely supported by both your workplace supervisor and by a visiting PTY tutor normally acting as your academic tutor. You will gain valuable experience of working within a professional clinical and medical research environment. You'll also further develop evidence-based analysis of your academic and professional experience throughout your placement culminating in a scientific report and its presentation. This module will further help you to focus and reflect on your PTY to ensure that you gain the maximum benefit from the year. During your placement you are closely supported by both your workplace supervisor and your visiting PTY tutor.

Our students have been awarded a prestigious placement in major pharmaceutical companies, such as AstraZeneca, BTG International and Pfizer. Placements with these companies are open to all UK undergraduates, and our students are closely supported by us throughout their application. Some of the research organisations our students have previously undertaken placements in include:

- Research laboratories within the NHS
- Harvard Medical School (USA)
- Johns Hopkins University (USA)
- University of California (USA)
- Public Health England
- Universities: King's College London, Imperial College London, Exeter, Oxford and Southampton.

Students who are not successful in securing a PTY placement (or who would like to only study for three years) will continue directly from the second year into the final year of the programme.

LEARNING AND TEACHING

Throughout the programme, you will benefit from a careful blend of innovative and traditional teaching methods employed by the Medical School, Biosciences, and Sport and Health Sciences departments. A variety of stimulating, cutting-edge resources are also available to support your learning.

Structured small group learning sessions

In tutor-led groups of about 12-14 students, you'll investigate key scientific concepts and systems presented in the form of triggers. The style of trigger varies week by week but will include patient-based clinical case studies, current media-worthy medical science breakthroughs and extracts from research papers. Within your group, you will discuss the trigger and report back your individual research findings, coming to a shared understanding of the medically relevant scientific knowledge important to fully understand the trigger. Throughout your degree you'll have the opportunity to apply your increasing knowledge to new triggers and build on the depth of your understanding. These small group sessions will also develop your critical thinking, problem design and solving, teamwork, presentation and lifelong learning skills which are essential for your career development.

Life Sciences Resource Centre activities

You'll be supported in your exploration of the human biomedical science that is presented in your small group sessions by the rich variety of state-of-the-art resources available in the Life Sciences Resource Centre. These resources include anatomical models, multimedia and IT resources, and a well-stocked library. Tutor-led activities will drive your engagement with selected resources in order to increase your understanding of the small group triggers.

Lectures and seminars

Large group lectures and cutting-edge research and Translational Science seminars delivered by academics as well as external speakers will complement your studies. Lectures may contain students from a variety of different programmes for which the lecture content is relevant.

Practical laboratory sessions

You'll develop your laboratory skills in our Medical Sciences and Sport and Health Sciences teaching laboratories on the St Luke's Campus, which are equipped with the best available instruments for observational, experimental and numerical aspects of biosciences including a range of biochemical, molecular, physiological and electronic apparatus. Computer-based practical sessions are held in the IT suite on the St Luke's Campus. Helpful and friendly technicians and demonstrators are always available during practical sessions to ensure that you get the most out of your training sessions.

Online learning

Your learning will be supported by the University's virtual learning environment. You will have individual access to electronic journals, content-rich study guides, and interactive online learning materials covering various science disciplines, formative online assessments and group discussion forums.

Assessment

Regular assessment is used to help provide you with frequent feedback, enabling you to identify your strengths, as well as areas for improvement. Feedback is provided in a number of different ways including online written feedback and self, peer, tutor or small group feedback.

Assessment in the early stages of the degree tends to be more knowledge-based to ensure a strong and broad grounding in the subject area, with some opportunities for essay-writing and critical analysis.

Assessment in the later degree stages tends to assess your critical appraisal skills, depth of understanding and your ability to think independently. Some assessments take place in groups, focusing on the team product or how well you lead your team to complete a task. A variety of assessment methods are employed across the programme, each aligned to the intended learning outcomes of the modules. Assessment formats include multiple-choice tests, essays, structured practical exams, oral and poster presentations, scientific report writing, short-answer question tests and independent project work.

Academic support

All students are assigned an academic tutor by the Medical School for the three or four years of their programme. Your academic tutor is responsible for monitoring and supporting your academic progress and offers support and guidance in remediation, module choice advice and career development via the Personal Development Planning programme. Your academic tutor will also support you through career and employability workshops and training events.

In addition, you'll be assigned a programme adviser from Biosciences or Sport and Health Sciences who will provide you with extra academic support for Biosciences or Sport and Health Sciences modules.

You will benefit from student representation in the Student-Staff Liaison Committee. This organisation enables student opinions and interests to be recognised, and provide an effective channel for formal communications between students and academic, clinical and administrative staff.

YOUR SUCCESSFUL CAREER

These programmes are designed to prepare you for employment in a wide variety of professional careers and helps to develop the key transferable skills valued by employers. These skills range from identifying and solving problems, to efficient communication, leadership and management. Key vocational skills, such as advanced laboratory training within molecular biology, also enhance your employability. Additionally, those students undertaking a Professional Training Year have an additional and invaluable insight into the professional workplace, having also potentially gained an employer reference for their CV.

Science graduates compete well in the wider graduate employment market, as they offer strong analytical and problem-solving skills valued highly across all sectors.

FUTURE CAREER PATHWAYS INCLUDE:

- Postgraduate study, either at a university or with the NHS
- Employment in knowledge industries, such as pharmaceuticals or medical technology. Roles might include research and development, clinical trials, or sales and marketing
- Training and employment to become a Scientific Officer in the Civil Service
- NHS management
- Postgraduate training for the NHS Scientist Training Programme (STP)
- Graduate entry to professional degrees such as radiotherapy
- Graduate entry to medicine, dentistry or other accredited healthcare programmes

CAREERS SERVICES

We have a dedicated, award-winning Careers Service, with offices at our Exeter and Penryn campuses, ensuring you have access to careers advisors, mentors and the tools you need to succeed in finding employment in your chosen field on graduation. We offer the Exeter Award and the Exeter Leaders Award which include employability-related workshops, skills events, volunteering and employment which will contribute to your career decision-making skills and success in the employment market. Our graduates compete very successfully in the employment market, many employers target the University when recruiting new graduates. For further information about our Careers Service please visit: www.exeter.ac.uk/careers

KEY INFORMATION AT A GLANCE

DEGREE PROGRAMME	UCAS CODE	TYPICAL OFFER
BSc Single Honours Medical Sciences	B100	AAB-ABB; IB: 34-32; BTEC: DDD-DDM
Medical Sciences with Professional Training Year	B101	AAB-ABB; IB: 34-32; BTEC: DDD-DDM
Sport and Exercise Medical Sciences	BC03	AAA-AAB; IB: 36-34; BTEC: DDD
Sport and Exercise Medical Sciences with Professional Training Year	BC04	AAA-AAB; IB: 36-34; BTEC: DDD
MSci Single Honours Medical Sciences (Human Genomics)	B300	AAB-ABB; IB: 34-32; BTEC: DDD-DDM
Medical Sciences (Environment and Human Health)	B300	AAB-ABB; IB: 34-32; BTEC: DDD-DDM

ENTRY REQUIREMENTS: MORE INFO

Programme requirement GCE AL science includes: Biology/Human Biology[▲]; Chemistry; Computing; Design and Technology; Electronics; Environmental Studies; Geography; Geology; Maths/Pure Maths/Further Maths[▲]; Physical Education; Physics; Psychology; Science (applied); Statistics.

[▲] If more than one of these is taken they would only count as one 'science' but could count as two A levels towards our general requirements.

Applicants studying a BTEC Extended Diploma will also require one grade A and one grade B in GCE AL science subjects, one of which must be Biology.

For full and up-to-date information on applying to Exeter and entry requirements, including requirements for other types of qualification, please see www.exeter.ac.uk/ug/applications

International students

You can find details of English language requirements and Foundation programmes at www.exeter.ac.uk/ug/international

ST LUKE'S CAMPUS, EXETER

Website: www.exeter.ac.uk/ug/medical-sciences
www.exeter.ac.uk/enquiry
Email: medicine@exeter.ac.uk
Phone: +44 (0)1392 725500

Biosciences

The Medical Sciences programmes are delivered in conjunction with Biosciences. You may also be interested in programmes within the Biosciences portfolio including BSc Human Biosciences, BSc Biochemistry and BSc Biological and Medicinal Chemistry; Study Abroad and professional placement variants of each of these programmes are offered. Full details of the programmes are available in the Biosciences subject brochure and online at www.exeter.ac.uk/ug/biosciences

Sport and Health Sciences

The Sport and Exercise Medical Sciences programmes are delivered in conjunction with Sport and Health Sciences. You may also be interested in programmes within the Sport and Health Sciences department including BSc Exercise and Sports Science, BSc Psychology with Sport and Exercise Science; Study Abroad and professional placement variants of each of these programmes are offered. Full details of the programmes are available in the Sport and Health Sciences subject brochure and online at www.exeter.ac.uk/ug/sport

WHY NOT CONSIDER...?

Neuroscience
www.exeter.ac.uk/ug/neuroscience

Medicine
www.exeter.ac.uk/ug/medicine

Biosciences
www.exeter.ac.uk/ug/biosciences

Sport and Health Sciences
www.exeter.ac.uk/ug/sport

THE UNIVERSITY OF EXETER



Teaching Excellence
Framework assessment 2017



5 star rated from QS



22,000 students from
178 countries



98% of our research rated of
international quality¹

RUSSELL
GROUP

A member of the Russell Group
of universities



The UK's fastest growing and
fastest rising research university²

FIND OUT MORE

Come to one of our open days. Visit us at our campuses
in Exeter and Cornwall: www.exeter.ac.uk/ug/visiting

For further information please visit
www.exeter.ac.uk/ug/medical-sciences

Accuracy of subject brochure information

The information in this subject brochure forms part of the undergraduate prospectus 2019 and is aimed at prospective undergraduate students wishing to apply for a place at the University of Exeter (the University) and start a course with us in autumn 2019. The prospectus and subject brochures describe in outline the courses and services offered by the University and we make every effort to ensure that the information provided is accurate and up-to-date at the time of going to print (undergraduate prospectus is printed January 2018 and subject brochures are printed in May 2018).

However, it may be necessary for the University to make some changes to the information presented in the prospectus following publication – for example, where it is necessary to reflect changes in practice or theory in an academic subject as a result of emerging research; or if an accrediting body requires certain course content to be added or removed. More information about our terms and conditions can be found at: www.exeter.ac.uk/undergraduate/applications/terms

¹ 98% of our research was rated as 2*,3* or 4* in the Research Assessment Exercise 2014.

² Between 2006/07 – 2015/16, the University of Exeter saw the greatest rise in research income, compared to all other Russell Group universities.

