BIOMEDICAL SCIENCE

Canterbury
ACADEMIC EXCELLENCE AND INSPIRATIONAL TEACHING

Kent is one of the UK’s leading universities, producing world-class research and excellent degree programmes.

World-leading research
The School of Biosciences at Kent ranks among the most active in biological sciences in the UK, with research funding at about £4 million per year. Outside bodies have commended the School for its research, which is acknowledged to attain international levels of excellence.

The research in the School is focused on understanding systems and processes in the living cell. It has a molecular focus and covers the disciplines of biochemistry, microbiology and biomedical science. The research projects currently ongoing in the School include: cancer biology and cancer therapies, bioprocessing and the development of novel therapeutics, genetic and prion diseases, virology, reproductive medicine, synthetic biology, protein folding and structural biology, the biology of aging, molecular motors, and bacterial pathogenesis and sensing.

Our research feeds directly into our teaching, providing exciting and relevant final-year projects, well-equipped and well-resourced laboratories, and ensures that you learn the most up-to-date science possible.

Passionate teaching
The School of Biosciences was awarded the maximum score of 24 in its teaching quality assessment, achieving full marks in areas such as the design and delivery of teaching materials, and the support and guidance we give our students. The assessors concluded that the School of Biosciences offers ‘well designed, flexible and coherent degree pathways, taught by dedicated and enthusiastic staff well-matched to the syllabus and clearly informed by industry and research’.

This reputation for teaching excellence in the School of Biosciences is reflected in the National Student Survey. For example, in the subject area of Biomedical Science, Kent has been rated as one of the top 10 universities in England and Wales for overall course satisfaction in five of the last seven years.

The School also has a reputation for innovation. One of our academics, Dr Dan Lloyd, has won a National Teaching Fellowship Award for his work on the School’s communication projects (see p17). These projects enable our science students to give talks in local schools and explain science to the public using various multimedia outlets. The School has also received several recent awards from the University and Kent’s student union, the most recent to Dr Klappa for ‘fantastic feedback’ (2013).

Supportive community
Teaching methods include lectures, lab classes and work in small groups (via tutorials, workshops and problem-solving sessions). We also use some self-learning packages. All students gain extensive practical training and spend up to two days a week in the laboratory. In the final year, there is the chance to conduct an eight-week research project.
We have excellent links with employers such as the NHS, GlaxoSmithKline and MedImmune, and can offer a sandwich year option, which gives you the opportunity to earn a salary for a year, evaluate a potential employer, and enhance your employment prospects. See p14 for details.

For more information on the careers help we provide at Kent, see p8 or visit our Employability webpage at www.kent.ac.uk/employability

**Summer Vacation Studentships**

We offer Summer Vacation Studentships, giving you the opportunity to apply for a paid eight-week research project in one of the School’s research labs during the summer vacation after your second year. Studentships are optional and do not contribute to your final degree result, but provide an ideal opportunity to experience the excitement of research first-hand and to gain valuable skills that will be useful when seeking employment or further study at the end of your degree. Our Summer Studentships are funded in part from money given to us by our alumni (The Stacey Fund) and all of our students are eligible to apply.

In addition, the School takes part in a competition organised by the International Genetically Engineered Machine (iGEM) Foundation, where, competing against other universities, undergraduate teams conduct lab-based research in the area of synthetic biology. Recently, Kent undergraduates gained a bronze award.

**Professional accreditation**

Our degree is accredited by the Institute of Biomedical Science (www.ibms.org), the professional body for biomedical scientists. Gaining an accredited degree will allow you to work as a biomedical scientist in the NHS once you have satisfactorily completed your ‘on the job’ training portfolio and registered successfully with the Health and Care Professions Council (HCPC). Our four-year Biomedical Science degree with a Sandwich Year is also accredited by the Society of Biology (www.societyofbiology.org).
SUPERB STUDENT EXPERIENCE

Based on a scenic campus, you have the use of modern teaching labs, with state-of-the-art technology.

Top class study facilities
The £1 million bioscience teaching laboratories ensure that our students have an excellent environment in which to develop their practical skills. The School of Biosciences also attracts a large research budget, which allows us to provide excellent research labs. If you choose to do laboratory research as part of your final-year project (see p17), you will work alongside our world-class research scientists, using the same high-level technology.

In 2013, over £2 million was spent upgrading the interior of the School and this refurbishment work will now progress to the outside of the building.

Also on campus are excellent academic facilities, such as the Templeman Library, which provides a wealth of resources with extensive print and electronic collections specifically aimed at supporting the subject areas taught at Kent. It is well-equipped with hundreds of study spaces and PCs, loan laptops, wireless access and printing and copying facilities.

Thriving scientific community
Our school collaborates with research groups in industry and academia throughout the UK and Europe. It has excellent links with local employers such as the NHS, GlaxoSmithKline, Genzyme, MedImmune, Eli Lilly and Lonza.

Friendly campus
The campus is built on 300 acres of parkland, overlooking Canterbury. Modern buildings are surrounded by open green spaces, courtyards, gardens, ponds and woodland. It’s self-contained and all the main facilities are within walking distance.

The campus facilities include: sports centre, cinema, theatre, concert hall, nightclub, restaurants, cafés, bars, medical centre, pharmacy, shop, off-licence, banks and laundry facilities. Many students comment on the friendly atmosphere at Kent which allows you to make friends from all over the world.

Beautiful location
Canterbury city centre is only a 25-minute walk or a short bus-ride from the centre of campus. It’s a beautiful city with many stunning medieval buildings and also has lively bars, pubs, restaurants and cafés, and a wide range of shops, from small independent outlets to high street chains. The attractive coastal town of Whitstable is close by and there are sandy beaches further along the coast. London is under an hour away by train.

A European university
Kent has a diverse cosmopolitan student population with 149 nationalities represented on campus. We have strong links with universities in Europe and Kent is only around two hours by train from Paris and Brussels.
Caitlin Griffiths is in the final year of her Biomedical Science with a Sandwich Year degree.

Why did you choose Kent?
Mainly because of the course, Kent offers an IBMS-accredited degree. Then, when I visited the University I thought the campus was very pretty and I also liked Canterbury. All in all, I thought it would be a relaxing environment in which to study.

How is the course going?
What I most enjoy about the course is its diversity – we cover so many areas from haematology to infection and immunity to laboratory medicine and I enjoy all of them. You can choose to specialise in a particular area if you want to, but you don’t have to. Also, all the modules offer lab projects, which are quite varied.

We do a final-year project, where you choose to do laboratory, communication or literature-based work. I chose to do a bioinformatics project because I spent a year working in a lab in my sandwich year. I am looking at microarrays and comparing microarray data to discover which genes are differentially regulated. It is a new area for me and I am learning new skills, such as how to handle large amounts of data and have had to master computer software to help with that. It’s great experience.

Where did you spend your sandwich year?
I worked at Sekisui Diagnostics in Kent. I was the only student there and was an extra pair of hands in the lab. I worked across a lot of projects helping with fermentation, cloning and on the purification of proteins. I really enjoyed my year in the lab and the experience I gained is invaluable; it definitely made me think about what I want to do next.

And what is that?
I think I want to keep learning and have applied to a few PhD programmes. Following my PhD, I would like to continue by doing post-doctoral research and eventually have my own lab. I really enjoy hands-on lab work, thinking about the work I am doing and what the possible outcomes might be and want to keep doing that rather than move into a management/administrative role.

What about the lecturers?
They are all approachable and knowledgeable, and are happy for you to ask questions after lectures or email them. When they tell you about their work, you can see how excited they are about it and that is inspiring.

And your fellow students?
We are an international group from quite diverse backgrounds but we all get along with each other – there are no cliques. We work hard and, through lab work and presentations, we learn a lot about working in a team and getting along with people.

What do you think of the social facilities on campus?
They are good, the bars and cafés all have good atmospheres and the societies are very good. I joined the Harry Potter Society, around 300 people attended the first meeting and we were all “sorted” – I ended up in Slytherin! The gym facilities and classes are outstanding.

Any advice for prospective students?
I would say university is for you if you are self-motivated, prepared to work hard and happy to be an independent learner; you also need to develop your time management.

Would you recommend Kent?
Yes I would. It is a very good place to come; it is a great location, everyone is helpful and friendly, and we have the sun in the south-east!
A SUCCESSFUL FUTURE

Many career paths can benefit from the numerical, analytical and communication skills that you develop during your studies. Most of our students are highly successful after graduation.

As well as providing a first-rate academic experience, we want you to be in a good position to face the demands of a tough economic environment. We are consistently in the top 20 of graduate starting salaries and in 2013, only 6% of Kent graduates were without a job or further study opportunity six months after graduation. We pride ourselves on helping students develop transferable skills through their studies.

**Common career paths**

About a third of our graduates go straight into laboratory work in hospital, industrial or university labs. Typical specialisms include medical microbiology, clinical chemistry, transfusion science, haematology, histopathology, cytology, virology and immunology. For work within the NHS, our degree is accredited by the Institute of Biomedical Science (www.ibms.org).

Another third of our graduates go on to become senior research scientists – a role that allows them to work at the cutting edge of scientific exploration. The most common route is to gain an MSc in a more specialised area or a PhD by joining an established research group. Most students receive full funding to support their scientific work while studying for a PhD.

The remaining third of our graduates go on to work in other areas. The skills you gain in your studies are useful in a range of careers. In recent years, students have found employment in teaching, scientific publishing, sales, marketing, banking, accountancy, police and social work. A good degree result can also qualify students to train in medicine or the veterinary profession.

**Professional experience**

Students who choose to take a sandwich year (see p14) often find this extra experience enhances their job prospects. They gain work experience, insight into the professional pathways available and useful skills. A year abroad can also provide valuable experience and an additional opportunity for personal development. See p10 for details.

A large number of our students also develop professional skills and gain hands-on experience through Kent's wide range of voluntary work opportunities (see www.kent.ac.uk/employability). We also offer Summer Vacation Studentships which are paid positions in the School available during the summer after your second year (see p3 for details).

**Careers advice**

The Careers and Employability Service can give you guidance in areas such as: how to choose your future career; how to apply for jobs; how to write a good CV; and how to perform well in interviews and aptitude tests. It also provides up-to-date information on graduate opportunities, before and after you graduate. For more details, go to www.kent.ac.uk/employability
Sam Godfrey graduated from the Biomedical Science programme in 2005; he now works for Cancer Research UK.

What attracted you to Kent?
There were many reasons. I visited in the summer and was struck by the acres of green space and the view of Canterbury; I knew that Canterbury was a great city, and was pleased to find that the University is very self-sufficient, with many bars, clubs and restaurants. This was very important to me! The School of Biosciences had a good reputation and I remember leaving an introductory lecture thinking, yes, this is where I want to come.

How were your studies?
My undergraduate degree was one of the best experiences of my life. I found the topics engaging and enjoyable, and loved lab work. A particular highlight was doing my own science project in my final year; my first taste of being a scientist. In terms of course content, I found I was most interested in diseases, particularly cancer, and my studies at Kent still resonate with me today.

What about the teaching?
The teaching was excellent. As demonstrated by the consistently good teaching reviews the School gets. I still remember many of my lecturers fondly, and the style of teaching made me realise that learning was something that could be fun.

How would you describe your fellow students?
Fun. My year group was very sociable, with 20 or 30 of us regularly going out together. It’s been 12 years since I started and I still regularly meet up with a lot of them.

Did your course change you?
First of all, it confirmed that I loved science. It changed me from merely being interested in science to being a young scientist. The experience at Kent helped me grow up and become a capable person. I’m sure I’ve still got some growing up to do, but a lot less than I would have if I hadn’t gone to uni.

What were the facilities like?
When I was there, the science facilities were adequate. But when I returned for my PhD in 2007, they had transformed to outstanding. I’ve seen facilities at other universities and Kent’s are right up there.

How was the social life?
It was fantastic, better than I could have imagined. And the opportunities to play sport or try your hand at unusual activities (like parachuting or caving) were many.

In what way has your degree helped you find work?
Following Kent, I was a scientist at Pfizer. I was then enticed back to Kent, to the lab of my two favourite lecturers, to do a PhD in cancer research. It was a great experience and I was lucky enough to represent the University at the House of Lords and many fancy garden parties (the nibbles were excellent). Following my PhD, I became a researcher at Imperial College London, looking at ways to help nerves repair themselves. And then I moved to my current, and best ever, job.

I work for Cancer Research UK as a science communications manager. I’m responsible for taking jargon-heavy science and making it interesting to the public and for our fundraising teams. On a typical day, I may write about some brilliant researcher for a team of fundraisers to use in a campaign. I may then be interviewed on radio or TV about a piece of breaking cancer news, or provide expert quotes for the media. I regularly sit in on creative sessions to come up with new ideas to raise money. Recently I’ve joined the CRUK blogging team, which means that I get to meet and interview famous or distinguished people, including Olympic champions and Nobel Prize winners.

What advice would you give to prospective students?
Career wise, I would advise students to aim to do what they enjoy. And if they aren’t qualified for their dream job, look for a job that will give you the experience you need and then move on. Pretty soon you’ll have the experience you need to walk into your perfect role.

If you want a good university that lets you have fun, helps you learn and turns you into a well-rounded student, then Kent is perfect. Even though I no longer live there, for me, Kent is home.
Not sure which programme to choose? Here’s a quick guide to the degrees on offer within the School of Biosciences.

**Biomedical Science**
This three-year programme explores the biochemical processes that occur in the human body, and human diseases such as cancer and the body’s response to infection. It offers its graduates a chance to put scientific knowledge into practical use within medical healthcare, in laboratory-based fields within the NHS, the pharmaceutical industry or medical research.

The degree is accredited by the Institute of Biomedical Science (www.ibms.org), important for those who wish to work in the NHS.

**Biomedical Science with a Sandwich Year**
The degree may be taken as a four-year programme with a paid work placement (Sandwich Year) between your second and final year of study. This can be in the UK or in another country. It is suitable for students who have a good level of achievement at Stage 1. For international students, holding a student visa entitles you to work in the UK as long as you are still registered as a full-time student. Since the Sandwich Year is a fully-registered part of your degree, this can provide an opportunity for international students to gain a year’s work experience in the UK.

**Biomedical Science with a Year Abroad**
This four-year programme allows you to spend a year abroad between the second and final year of your degree – giving you a fantastic opportunity to immerse yourself in another culture.

All our year abroad exchanges are with universities where the teaching is in English, so you do not need a foreign language qualification to take this option. Currently we have exchanges with over 20 universities in North America, and in the Netherlands, Turkey, Australia and Malaysia. The subjects you study during your year abroad will complement your programme at Kent and the extra year allows you to study a wider range of topics than is possible on a three-year degree programme.

**Other degree programmes**
The following degrees are also available within the School of Biosciences.

**Biology**
Biology is the study of living organisms and their interactions with the environment. The subject includes socially relevant topics such as the use of genetically modified organisms, stem-cell research and human fertility.

**Biochemistry**
Biochemistry deals with the way living organisms function at the molecular level. How do living organisms work? How are they built, controlled, repaired and supplied with energy? Biochemistry is an ideal degree if you want to enter a research career in a life sciences area.

**International students**
If you are applying from outside the UK without the necessary English language qualifications, you may be able to take the Kent International Foundation Programme. We have recently set up a biosciences strand that leads to progression on to our Biology, Biomedical Science or Biochemistry degrees. You will need strong results in your national school-leaving qualifications in biology and, preferably, chemistry, which will be assessed on an individual basis. For more details, see www.kent.ac.uk/internationalpathways/ifp

**Need more information?**
For Biology or Biochemistry, see www.kent.ac.uk/ug

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**DID YOU KNOW?**
Kent is a leading university and is ranked as one of the top 20 UK universities in The Guardian University Guide 2014.
STUDYING AT STAGE 1

Stage 1 is the first year of your degree programme. Your modules provide a broad survey of the various biological disciplines and include aspects of human health and disease.

Teaching is via lectures, supervisions, tutorials and laboratory classes. Each module involves, on average, 24 hours of lectures, three one-hour supervisions as well as practical laboratory sessions.

Most Stage 1 modules are assessed by 50% coursework and 50% exam. At Stage 1, you need to reach a satisfactory standard to proceed to the second year. However, no Stage 1 marks are carried forward to your final degree result.

You study the following compulsory modules:
• Biological Chemistry B (double module)
• Enzymes and Introduction to Metabolism
• Genetics and Evolution
• Human Physiology and Disease
• Introduction to Biochemistry
• Molecular and Cellular Biology
• Skills for Bioscientists.

Modules: Stage 1

Biological Chemistry B
The principles of chemistry are an essential foundation for biochemistry. Building up from the atomic level, this module introduces periodicity, functional groups, compounds and chemical bonding, molecular forces, molecular shape and isomerism, and chemical reactions and equilibria, enabling you to understand the importance of organic chemistry in a biological context.

Enzymes and Introduction to Metabolism
You are introduced to metabolic pathways and the control of metabolism by changes in enzyme activity. The module covers the rates of biological processes and the theoretical principles underlying them, the basic structure and function of enzymes and their kinetics. You perform enzyme assays to determine their kinetic properties and also study the key pathways of metabolism in animals and their control mechanisms.

Genetics and Evolution
This module explores the historical views on evolution, the action of DNA, population genetics and speciation. You gain an understanding of Mendelian inheritance and the ability to predict the outcomes of mono- and dihybrid crossbreeding, as well as an insight into Darwin’s observations on the role of genetics in evolution.

Human Physiology and Disease
This module considers the anatomy and function of normal tissues, organs and systems and their diseases. We look at the manifestation of the various conditions at the level of cells, tissues and the whole patient, and also discuss diagnosis, available prognostic indicators and treatments.

Introduction to Biochemistry
You are introduced to biomolecules in living matter. The module contrasts the simplicity of the basic building blocks of macromolecules (amino acids, sugars, fatty acids and nucleotides) with the enormous variety and adaptability of the different macromolecules they form (proteins, carbohydrates, lipids and nucleic acids). It highlights the nature of the molecular structure of the macromolecules and their interactions within the cellular environment.

Molecular and Cellular Biology
This module introduces you to the key themes and experimental techniques in molecular biology, genetics and eukaryotic cell biology. It covers basic cell structure, the principles of the cell cycle and cell division, the control of living processes by genetic mechanisms, and techniques for genetic manipulation such as gene cloning.

Skills for Bioscientists
Subject-based and communication skills are relevant to all the bioscience courses. In this module, you become familiar with practical skills, the analysis and presentation of biological data and are introduced to some basic mathematical and statistical skills as applied to biological problems. You also learn essential skills such as note-taking and essay writing.
STUDYING AT STAGE 2

Stage 2 is the second year of your degree programme and your marks contribute towards the grading of your final degree. The modules during this stage become more specialised, focusing on such topics as infectious disease, immunology, physiology and pharmacology.

You take the following compulsory modules:
- Infection and Immunity
- Investigation of Disease
- Metabolism and Metabolic Disease
- Microbial Physiology and Genetics
- Pharmacology
- Physiology
- Skills for Bioscientists 2.

You also choose one option from:
- Cell Biology
- Gene Expression and its Control
- Metabolism and Metabolic Regulation.

Modules: Stage 2

Infection and Immunity
This module provides you with an understanding of the major diseases of infectious origin that colonise human body tissues. It covers the principles of epidemiology, and looks at medically important diseases such as the HIV virus and Aids. The features and functions of immune cells and molecules used in the defence of the body against invading microorganisms are studied.

Investigation of Disease
You are introduced to clinical biochemistry and screening for metabolic disease, and cellular pathology and screening for malignant disease; two of the main branches of laboratory medicine through a study of human disease and their investigation within a clinical setting. Exposure to professional biomedical scientists working within the different disciplines, and to the unique NHS environment, also supports you in making career choices for the future.

Metabolism and Metabolic Disease
In this module, you discover how errors in metabolic processes result in the development of human diseases such as phenylketonuria, gout, hypercholesterolaemia, diabetes and porphyrias.

Microbial Physiology and Genetics
This module includes a review of the structure and biosynthesis of bacterial and fungal cells, their key metabolic processes and their quest for food. You also study microbial growth, genome organisation and structure, and mechanisms of DNA transfer.
Pharmacology
This module introduces you to the major concepts underpinning pharmacology – the study of drugs and their actions in cells, tissues and whole animals. You learn to describe the effects of drugs in cells and to relate the mechanism of drug action to their therapeutic intervention in disease.

Physiology
This module develops a more detailed understanding of particular physiological systems and relates this to relevant disease processes and their detection. The role of research and laboratory methods in understanding human disease is also introduced.

Skills for Bioscientists 2
In this module, you develop key skills in undertaking and communicating science. Focused around ‘mini-project’ work, you are introduced to new techniques and also how to plan and design your own experiments for a short three-day project. You present your work through an oral presentation and a project report. You develop skills in essay writing, report writing and in addition, there are presentations on careers to help you start thinking about future career options.

Cell Biology
This module reviews the experimental approaches used to investigate the biology of the cell and highlights the similarities and differences between cells of complex multicellular organisms and microbial cells. Initially, you consider the functions of the cytoskeleton and cellular compartments such as the nucleus. Later in the module, you examine the mechanisms by which newly synthesised proteins are secreted or shuttled to their appropriate cellular compartments.

Gene Expression and its Control
This module deals with the molecular mechanisms of gene expression and its regulation in prokaryotes and eukaryotes. This involves descriptions of how genetic information flows from DNA to RNA to protein, how this flow is controlled in specific tissues and cells throughout development and how it is disrupted in cancer cells.

Metabolism and Metabolic Regulation
This module describes the integration of the many chemical reactions underpinning the function of cells. For example, how cells make ATP and use it to drive cellular activities, and how plant cells harvest energy from the sun in the process of photosynthesis.
WORK EXPERIENCE: THE SANDWICH YEAR

If you choose to do a Sandwich Year, it takes place between Stages 2 and 3.

Excellent links with employers
In the past, our students have taken placements with employers such as the NHS, GlaxoSmithKline, Lonza, MedImmune, AstraZeneca and Eli Lilly. The School has established excellent links with these employers, as well as many others.

Finding a placement
Work placements are usually advertised nationally and students apply by sending in a CV or application form. We guide you through the process, giving you valuable feedback on the placements that are likely to enhance your career prospects, how to write a winning CV and how to hone your interview skills.

Salary and benefits
Students usually work on placement for the entire calendar year. Salary and holiday entitlements vary according to the employer you work for. However, many students find that they earn enough to be able to save some of their income, and this often helps them in their final year of studying at Kent.

Study and career benefits
A work placement provides practical experience that can be put to good use in your final year of study. It gives you a sense of how the theory works in practice and improves your skills in many areas. It also allows you to evaluate a particular career path and gain knowledge of the working environment.

In general, the Sandwich Year is very popular with employers, because of the skills you gain in the workplace. If your placement is a success, you may even be offered a job with the same employer after graduation.

Keeping in touch with Kent
Your tutor maintains close contact with you during your year away from the University, checking on your progress and paying a visit to your workplace. All placement students come back on to campus for a day halfway through the year to talk about their work with other students and staff. At the end of your Sandwich Year, your work is assessed by a presentation and written report, and these contribute 10% to your overall degree mark.

“I decided to take a sandwich year and work in a lab; I would encourage people to do a placement because it gives you experience, not only in the field, but as a person. I have no doubt that my placement will enhance my employability after I graduate.”

Lina Mikaliunaite
Biomedical Science with a Sandwich Year
Stage 3 is the final year of your degree. One of your compulsory modules is a research project, which counts for a quarter of your final-year marks.

You take the following compulsory modules:
- Advanced Immunology
- Haematology and Blood Transfusion
- Pathogens and Pathogenicity
- Research Project (double module, see p17).

You also choose three options from:
- Bioinformatics and Genomics
- Biological Membranes
- Cancer Biology
- Cellular Communication
- Frontiers in Oncology
- Integrated Endocrinology and Metabolism
- Magnetic Resonance in Biosciences and Medicine
- Microbial Physiology and Genetics II
- Neuroscience
- Virology.

**Modules: Stage 3**

**Advanced Immunology**
Since the discovery of HIV, much progress has been made in our understanding of how the immune system functions. Here, we review topical aspects of this subject, with an emphasis on the regulation of the immune response, and the role of dysfunctional immune systems in a variety of disease states.

**Haematology and Blood Transfusion**
This module describes the anatomy, physiology, pathology and therapy of the blood and blood forming tissues, including the bone marrow. It covers a wide range of disorders including haematological malignancies, infection with bloodborne parasites that cause malaria, and inappropriate clotting activities.

**Pathogens and Pathogenicity**
Here, you cover the molecular basis for microbial pathogenesis in relation to bacterial, viral and fungal pathogens, focusing on human infections. Topics covered in detail include host-pathogen interactions, therapeutic strategies, vaccination and the role of viruses in the development of cancer.

**Research Project**
You work independently on a research project, but have regular meetings with a supervisor who guides you through the process and provides advice and support. Your supervisor will be an academic whose research interests are related to your topic. See p17 for more details.

**Bioinformatics and Genomics**
The past decade has seen a massive increase in protein structure and genome sequence information. In this module, you investigate how modelling can be used to predict protein function and how genetic variants identified in the genome sequences can be analysed for their ability to cause disease. Lectures teach you the theory and the bioinformatics analyses are carried out in computer workshops.

**Biological Membranes**
Cells and subcellular compartments are separated from the external milieu by lipid membranes with protein molecules inserted into the lipid layer. The structure and function of these two components are diverse, ranging from regulatory functions to maintaining the structure of the cell.

**Cancer Biology**
In this module, you explore the molecular basis of cancer and assess how this knowledge may be used to develop new therapeutic strategies to tackle the disease in its variety of forms. Topics include: the regulation of gene expression, the role of growth factor signalling, cancer stem cells, cell apoptosis, chemo-resistance, cell metastasis, tumour immunology, and targeted cancer therapies and clinical trial design.

**Cellular Communication**
You are introduced to the nervous and endocrine systems of the body and their role in intercellular communication. You also study intracellular signalling systems – including the role of signal transducers, second messengers, and the regulation of cell function by protein phosphorylation.
Frontiers in Oncology
This module introduces the basic principles of cancer biology and cancer therapy. It explains the characteristics of cancer and why the development of more effective anti-cancer therapies is so extremely challenging. The module includes interactive discussions on a number of recent scientific publications that highlight the important issues in cancer research today.

Integrated Endocrinology and Metabolism
This module focuses on the endocrine system, one of the two great control systems of the body. In conjunction with the nervous system, these two regulatory systems monitor changes in an animal’s internal and external environments and direct the body to make any necessary adjustments to its activities so that it adapts itself to these environmental changes.

Magnetic Resonance in Biosciences and Medicine
You gain a basic understanding of magnetic resonance as used in NMR and MRI, and discover how these two techniques have been used in research and medicine. The first section of the module introduces the use of NMR to study proteins, peptides, nucleic acids, carbohydrates, lipids and metabolites, while the second section looks at the use of MRI in imaging, including functional MRI used to study brain activity in patients with stroke, head injury or neurodegenerative disease such as Alzheimer's.

Microbial Physiology and Genetics II
This advanced module focuses on how physiological homeostasis is maintained in the bacterial cell in response to environmental stresses. It explores the current experimental approaches used to study this area, the variety of different ways that gene expression is controlled and microbial biodiversity.

Neuroscience
The molecular and cellular basis of the development of the nervous system from a simple sheet of neuroepithelial cells is discussed followed by an investigation of the molecules and mechanisms involved in the transmission of signals between nerve cells. Finally, you explore how the nervous system controls a variety of behaviours such as learning, memory, sleep and dreaming.

Virology
You survey the full replication cycle of a broad range of viral families, including newly emerging infectious diseases. The module includes interactive discussions on a number of recent scientific publications that highlight the relevant and important issues in the field of virology today.
In your final year (Stage 3), you complete the eight-week Research Project. You choose a project that interests you from a wide range of options.

You work independently but have regular meetings with a supervisor who guides you throughout and provides advice and support. Your supervisor will be an academic whose research interests are related to your topic.

There are three types of project on offer – a laboratory-based project, a literature and data analysis project, or a communication project.

If you choose a laboratory-based research project, you will often meet and work with other members of your supervisor's research team and use the equipment and facilities within the team's research lab.

Laboratory-based project

Laboratory projects are offered in all of the research areas of the School. Current research projects include: cancer biology and cancer therapies, bioprocessing and the development of novel therapeutics, genetic and prion diseases, virology, reproductive medicine, synthetic biology, protein folding and structural biology, the biology of ageing, molecular motors, and bacterial pathogenesis and sensing. You carry out research of interest to your supervisor and their research group. You have the possibility of seeing or discovering something for the first time and your work may be published in the scientific literature.

Example project titles include:
- Genome organisation in sperm nuclei using a novel analysis system
- Engineering mammalian cells to produce larger yields of recombinant therapeutic protein ‘bio-drugs’ more efficiently and at lower cost
- Synthetic biology and metabolic engineering of biological processes

Literature and data analysis project

A literature and data analysis project gives you the opportunity to dig deep into the scientific literature to fully understand an area of research including the analysis of published (or in some cases unpublished) data. The topic will be one that is of interest to your supervisor, who will initially direct you to exciting papers and discuss your findings and ideas with you on a regular basis.

Recent student projects include:
- What do telomeres have to do with ageing and disease?
- Mitochondria as therapeutic targets to extend lifespan
- Does influenza virus morphology reflect adaptation to growth in human hosts?
- How different is resistance development to the platinum drugs cisplatin, carboplatin and oxaliplatin in neuroblastoma cells?

Communication project

One of the key challenges facing scientists is to make their work interesting, accessible and relevant to the public. A communication project can develop these key skills and broaden your employment opportunities.

Communication projects are offered in a wide range of topics or you can suggest your own. The topic will be a poorly understood or controversial area of bioscience and you not only research the topic and write an up-to-date science report, but also think about how you can explain your findings to a non-scientific audience. You put this into practice by giving a presentation in a secondary school and by preparing a website or a written article for a newspaper or magazine.

Recent student projects include:
- Sleep – a waste of time or an essential behaviour?
- Beyond genetics: how epigenetics controls your life
- Are sugary beverages a threat to global health?
- The evolutionary battle between the human red blood cell and the malaria parasite.

“It is exciting having final-year project students working in the lab. I think the opportunities for them are tremendous, and it gives me the chance to investigate something of interest which I might not otherwise find the time to do.”

Bill Gullick
Professor of Cancer Biology
VISIT THE CAMPUS

Come along for an Open Day or a UCAS Visit Day and see for yourself what it is like to be a student at Kent.

Open Days
Kent runs Open Days during the summer and autumn. These provide an excellent opportunity for you to discover what it is like to live and study at the University. You can meet academic staff and current students, find out about our courses and attend subject displays, workshops and informal lectures. We also offer tours around the campus to view our sports facilities, the library, and University accommodation.

For further information and details of how to book your place, see www.kent.ac.uk/opendays

UCAS Visit Days
If you apply to study at Kent and we offer you a place (or invite you to attend an interview), you will usually be sent an invitation to one of our UCAS Visit Days. You can book to attend through your online Kent Applicant Portal. The Visit Day includes presentations about our School, and you can attend a ‘taster’ lecture about one of our research areas. You have the opportunity to speak with academic staff and current students about your chosen subject. There are also guided tours of the campus, including University accommodation.

For further information, see www.kent.ac.uk/visitdays

Informal visits
You are also welcome to make an informal visit to our campuses at any time. The University runs tours of the Canterbury and Medway campuses throughout the year for anyone who is unable to attend an Open Day or UCAS Visit Day. It may also be possible to arrange meetings with academic staff, although we cannot guarantee this. For more details and to book your place, see www.kent.ac.uk/informal

Alternatively, we can provide you with a self-guided tour leaflet, which includes the main points of interest. For more details and to download a self-guided tour, go to www.kent.ac.uk/informal

Scholarships and bursaries
For details of scholarships and bursaries at Kent, please see www.kent.ac.uk/scholarships
On the web
For the latest School information on studying biomedical science at Kent, please see www.kent.ac.uk/bio

More information
If you have any further queries on how to choose your degree, our admissions procedures, how to prepare for your studies or would like information about the University of Kent’s facilities and services, please contact us.

T: +44 (0)1227 827272
Freephone (UK only): 0800 975 3777
www.kent.ac.uk/ug

Terms and conditions: the University reserves the right to make variations to the content and delivery of courses and other services, or to discontinue courses and other services, if such action is reasonably considered to be necessary. If the University discontinues any course, it will endeavour to provide a suitable alternative. To register for a programme of study, all students must agree to abide by the University Regulations (available online at: www.kent.ac.uk/regulations).

Data protection: for administrative, academic and health and safety reasons, the University needs to process information about its students. Full registration as a student of the University is subject to your consent to process such information.

Location
Canterbury.

Award
BSc (Hons).

Programme type
Full-time.

Degree programme
Single honours
• Biomedical Science (B940)
• Biomedical Science with a Sandwich Year (B942)
• Biomedical Science with a Year Abroad (B943)

Offer levels
BBB to ABB at A level, IB Diploma 34 points inc 16/15 points at Higher inc Biology 5 at HL or 6 at SL and Mathematics 4 at HL or SL.

Required subjects
A level Biology or Human Biology at grade B.
GCSE Mathematics grade C.

Sandwich Year
Students have the chance to spend a year working in industry between Stages 2 and 3. See p14 for details.

Year Abroad
Students have the chance to spend a year studying abroad between Stages 2 and 3. See p10 for details.

Professional recognition
The Biomedical Science degree programme is accredited by the Institute of Biomedical Science (IBMS). The four-year Biomedical Science with a Sandwich Year (B942) programme is also accredited by the Society of Biology.

Offer levels and entry requirements are subject to change. For the latest information, see www.kent.ac.uk/ug
COME AND VISIT US

We hold Open Days at our Canterbury and Medway campuses.
For more information, see: www.kent.ac.uk/opendays