The Faculty of Life Sciences undertakes world-leading research and teaching, which combines the strengths of UCL’s basic biological and preclinical sciences. Our work attracts staff and students from around the world and together they create an outstanding and vibrant environment for both students and researchers. Internationally recognised scientists running laboratories in individual research departments provide expert teaching and outstanding research training opportunities in all aspects of molecular, cellular, whole organism and population biology. Collaborations within the faculty and with other UCL faculties and national research bodies extend the traditional subject boundaries to provide exciting new training opportunities in interdisciplinary research areas of strategic importance.

Division of Biosciences 86
Cell and Developmental Biology 87
Genetics, Evolution and Environment 88
History of Medicine 89
Neuroscience, Physiology and Pharmacology 90
Structural and Molecular Biology 91
School of Pharmacy 92

Faculty Institutes
Gatsby Computational Neuroscience Unit 93
Laboratory for Molecular Cell Biology 94
CoMPLEX (Centre for Mathematics and Physics in the Life Sciences and Experimental Biology) 103
UCL Biosciences is one of the largest multi-disciplinary research environments in the UK with over 120 research active laboratories.

We provide Master's and PhD programmes in areas ranging from structural biology through to development, neuroscience, genetics and biology of organisms.

State-of-the-art facilities enhance the research environment and provide students with opportunities to enhance their academic skills.

Our excellence is founded on the legacy of Nobel Prizes awarded to six of our alumni: Black, Evans, Hill, Huxley, Katz, and Medawar.

The four-year London Interdisciplinary Biosciences PhD comprises taught courses and two four-month laboratory rotations in the first year. Students are involved in a range of interdisciplinary research projects that involve collaborations between supervisors drawn from across UCL.

Entry requirements
A minimum upper-second-class UK Bachelor’s degree in a relevant subject or an overseas qualification of an equivalent standard. Applicants should be confident using computers and show some evidence of numeracy.

Career prospects
Students graduating from this programme will have the multidisciplinary skills necessary for a leading academic research career as well as for a career in the bioscience and biotechnology-based industries.

Taught programmes

<table>
<thead>
<tr>
<th>Programme</th>
<th>Duration</th>
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</thead>
<tbody>
<tr>
<td>Biodiversity, Evolution and Conservation MRes</td>
<td>FT1</td>
</tr>
<tr>
<td>Biosciences MRes</td>
<td>FT1</td>
</tr>
<tr>
<td>Synthetic Biology MRes</td>
<td>FT1</td>
</tr>
<tr>
<td>Systems Biology MRes</td>
<td>FT1</td>
</tr>
<tr>
<td>History of Medicine MA</td>
<td>FT1 PT2</td>
</tr>
<tr>
<td>Biomedical Sciences MSc</td>
<td>FT1 PT2</td>
</tr>
<tr>
<td>Genetics of Human Disease MSc</td>
<td>FT1</td>
</tr>
<tr>
<td>Neuroscience MSc</td>
<td>FT1 PT2</td>
</tr>
<tr>
<td>Pharmacogenetics and Stratified Medicine MSc</td>
<td>FT1</td>
</tr>
</tbody>
</table>

Entry requirements
History of Medicine MA: normally an upper second-class Bachelor’s degree in a relevant discipline from a UK university or an overseas qualification of an equivalent standard.

MRes and other MSc programmes: normally, a minimum of an upper second-class UK Bachelor’s degree in biomedical sciences, life sciences or a related subject area, or a medical degree (MBBS), or an overseas qualification of an equivalent standard. Applicants with an appropriate professional qualification and relevant work experience may also apply.

Career prospects
Recent Biosciences MRes graduates have gone onto study PhDs at UCL and other universities in the UK and Spain. Others have pursued careers as a research technician, in law and clinical psychology.

Recent History of Medicine MA graduates have gone on to study MPhils or PhDs in medicine stem cell research in the UK and overseas, or have taken up academic positions in the UK. Others have pursued medical careers in ophthalmology, clinical trials and elsewhere in the NHS.

Recent Genetics of Human Disease MSc graduates have gone onto study PhDs in the field, or continue with related research. Others have pursued careers in medicine or within pharmaceutical companies.

Many Neuroscience MSc graduates go on to funded PhD places, within UCL or one of its affiliated organisations, or other universities in the UK (e.g. Imperial College London, Bristol, Edinburgh, Reading) or overseas (e.g. Pittsburgh). Others have gone on to employment in related fields, e.g. hospital work or the pharmaceutical industry, whilst others have taken up careers in teaching or work in unrelated fields, such as computing.

Careers data from our Biodiversity, Evolution and Conservation MRes, Synthetic Biology MRes, Systems Biology MRes, Biomedical Sciences MSc and Pharmacogenetics and Stratified Medicine MSc programmes is not yet available.

Funding
The PhD is fully funded by the BBSRC. For other PhD studentships in the division, please see pages 89–93.

MRC funding for the Genetics of Human Disease MSc is available

Departmental scholarships for Master’s degree programmes.

Further information on pages 26–31

Related departments
Cell and Developmental Biology, page 87
Genetics, Evolution and Environment, page 88
History of Medicine, page 89
Neuroscience, Physiology and Pharmacology, page 90
Structural and Molecular Biology, page 91

Contact details
For taught programmes, please refer to: www.ucl.ac.uk/biosciences/masters

Tuition fees
Up-to-date tuition fee information is available at www.ucl.ac.uk/current-students/money

Angad Pathakji
Pharmacogenetics and Stratified Medicine MSc

I was quite fascinated with the idea that one can actually design a drug and also determine the optimum dose of the drug to each patient individually based on their genetic make-up. By studying the relation between genes and drugs, optimum therapy can be prescribed and a better healthcare system can be established. I was awarded a £2,000 scholarship from the UCL Genetics Institute which I put towards the cost of my tuition fees.

144 academic staff
271 research students
114 taught graduate students

Research programme
PhD

FT4

114 research students
271 taught graduate students

Division of Biosciences

144 academic staff
271 research students
114 taught graduate students

Division of Biosciences

144 academic staff
271 research students
114 taught graduate students
The Research Department of Cell and Developmental Biology brings together leading international experts in cell, developmental and evolutionary biology including stem cells and regeneration.

The field is one of the fastest growing and most exciting in biomedical research, and among UCL’s greatest strengths.

We have superb imaging facilities and the largest zebrafish genetics facility in the UK.

The Wellcome Trust-funded PhD in Developmental and Stem Cell Biology and the UCL Centre for Stem Cells come together here and offer unique opportunities for students in translational and industrial applications.

Research programmes

<table>
<thead>
<tr>
<th>MPhil/PhD</th>
<th>FT3</th>
<th>PT5</th>
</tr>
</thead>
<tbody>
<tr>
<td>PhD</td>
<td>FT4</td>
<td>---</td>
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</tbody>
</table>

PhD programmes are available for three years in a single laboratory or four years including rotations between different laboratories in the first year to provide the basis for an informed choice for the research project in years two to four. The research department hosts several series of regular seminars with internationally renowned speakers.

Research areas are:

- Biological clocks/sleep
- Cell fate determination and pattern formation
- Cell migration
- Cell signalling and signal transduction mechanisms
- Early development (e.g. fertilisation, gastrulation, embryonic induction)
- Evolution and development
- Intracellular movements: endocytosis, exocytosis, RNA, protein, lipid and organelle traffic
- Left-right asymmetry
- Live imaging
- Neural development and neural cell biology
- Neuroaesthetics
- Regeneration and repair
- Stem cell biology
- Wound healing.

Entry requirements

A minimum of an upper second-class UK Bachelor’s degree in an appropriate subject or an overseas qualification of an equivalent standard, or a recognised Master’s degree in an appropriate subject.

Career prospects

Recent graduates have taken up postdoctoral positions: in the UK at UCL, King’s College London and the University of Cambridge, and across the world at the MDC in Berlin, the University of Bordeaux, Stanford University, Temple University in Philadelphia and the Memorial Sloan Kettering Center in New York. Others have continued medical studies or taken up research and teaching positions at the National Science Museum in Japan, Mahidol University in Bangkok and Abbott Labs in Athens.

Contact details

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TEL +44 (0)20 7679 3334

Tuition fees

Up-to-date tuition fee information is available at www.ucl.ac.uk/current-students/money

Funding

Across the division there are three Wellcome Trust four-year programmes and one MRC four-year programme; MRC, BBSRC four-year PhD, BBSRC quota and CASE three- and four-year studentships; NERC, and others. There may also be funding opportunities through individual research grants as well as through other programmes such as those offered by CoMPLEX.

Further information on pages 26–31

Related departments

Genetics, Evolution and Environment, page 88
History of Medicine, page 89
Neuroscience, Physiology and Pharmacology, page 90
Structural and Molecular Biology, page 91
GENETICS, EVOLUTION AND ENVIRONMENT

The Research Department of Genetics, Evolution and Environment (GEE) carries out world-class research and promotes an integrative approach to understanding biological systems at functional and genomic levels.

We provide an enabling environment with excellent research facilities, analytical equipment and specialised laboratories.

Staff play significant roles in the Centres for Ecology and Evolution; Genetic Anthropology; Mathematics and Physics in the Life Sciences and Experimental Biology, the Environment Institute and the Institute of Healthy Ageing.

GEE is also home to the UCL Genetics Institute, which applies biostatistical analysis and bioinformatic approaches to the genetics of clinical disease.

Research programmes

<table>
<thead>
<tr>
<th>MPhil/PhD</th>
<th>FT3</th>
<th>PT5</th>
</tr>
</thead>
</table>

Research areas are:
- Biodiversity and environmental biology
- Biology of ageing
- Computational biology
- Evolutionary genetics
- Evolution and development
- Human genetics and human evolution
- Systems biology

Entry requirements

A minimum of an upper second-class UK Bachelor’s degree in an appropriate subject, or an overseas qualification of equivalent standard.

Career prospects

Recent graduates have taken up academic posts at various universities and research institutes across the globe at UCL, King’s College London, Universities of California, Michigan, Bristol and Dundee and the Museum National d’Histoire Naturelle, Paris. Others have entered professional occupations within organisations such as the Zoological Society of London, Natural England and GlaxoSmithKline.

Antonia Ford
Genetics, Evolution and Environment MPhil/PhD

I am studying the evolutionary relationships of East African cichlid fish, which exhibit fast speciation rates and remarkable diversity, and so are of particular interest in examining adaptation and diversification. GEE provides a supportive and inspiring environment for postgraduate research, as well as collaborative links to other UCL departments, London institutions, and beyond.

Contact details
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Tuition fees

Up-to-date tuition fee information is available at www.ucl.ac.uk/current-students/money

Funding

Across the division there are three Wellcome Trust four-year programmes and one MRC four-year programme; MRC, BBSRC four-year PhD, BBSRC quota and CASE three- and four-year studentships; NERC; and others. There may also be funding opportunities through individual research grants as well as through other programmes such as those offered by CoMPLEX.

Further information on pages 26–31

Related departments

- Cell and Developmental Biology, page 87
- CoMPLEX, page 103
- History of Medicine, page 89
- Neuroscience, Physiology and Pharmacology, page 90
- Structural and Molecular Biology, page 91
HISTORY OF MEDICINE

The UCL Centre for the History of Medicine is a leading site for research and teaching in the subject.

The centre is located in close proximity to the Wellcome Library for the History of Medicine, the British Library, and other major collections in the capital.

It maintains an active programme of seminars and workshops.

Entry requirements
A Master’s degree in a relevant discipline from a UK university, or an overseas qualification of an equivalent standard.

Career prospects
We expect our graduates to pursue a career in higher education, museum, library or archival work and journalism. Recent graduates have taken up academic posts at the Universities of Lisbon, Grenoble and Tokyo.

Research programmes
MPhil/PhD

- Cultural history of madness, particularly in relation to ethnicity and infectious disease systems
- Historiography and historical epistemology
- History of neurology and neuroscience
- Oral history
- Visual culture.

Contact details
Research programmes:  Professor Roger Cooter
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TEL: +44 (0)20 7679 3204

Tuition fees
Up-to-date tuition fee information is available at www.ucl.ac.uk/current-students/money

Funding
Further information on pages 26–31

Related departments
Biosciences, page 86
History, page 131
Science and Technology Studies, page 100

Sally Frampton
History of Medicine PhD

The ways in which health and illness are understood and negotiated reflects deeply upon the culture they are embedded in, speaking to religion, gender and economics, to name just a few things. Thus medicine is a significant part of society that must always be considered if we wish to understand the past. Furthermore, we must look to the past to help us to understand our own present day experiences of health and illness. I am passionate about this subject and about what it can teach students and I hope to pursue a career as a medical historian once I finish my PhD. My biggest passion outside of work is music. While unfortunately I don’t have time to play in a band anymore (I used to play bass guitar in an indie-folk band!) going to gigs still gives me great pleasure and is one of my favourite ways to relax after a stressful day!
The Research Department of Neuroscience, Physiology and Pharmacology (NPP) includes the majority of UCL’s basic neuroscience community, with broad interests in the nervous system and signalling.

The range of expertise is vast, spanning molecular and structural neuroscience through to cellular and systems neuroscience, including aspects of translational research, such as pain.

Grant income is about £11 million each year with many collaborations established within UCL, in the UK and worldwide, as well as with industry.

The department has an outstanding world-leading reputation for research, being ranked the highest in its sector (RAE 2008).

Research areas are:

- **Cellular, molecular and structural neuroscience**: synaptic transmission and ligand-gated ion channels; transporters and signalling molecules; G-protein coupled receptors and voltage-gated ion channels
- **Systems and translational neuroscience**: neuronal network behaviour; pain; *in vivo* patch electrophysiology; optogenetics
- **Interstitial signalling**: inflammation; cardiovascular system.

**Entry requirements**

A minimum of an upper second-class Bachelor’s degree from a UK university in a relevant discipline or an overseas qualification of an equivalent standard.

**Career prospects**

Recent graduates have taken up research positions in academia, including at UCL, Imperial College London, Oxford University, Queen Mary, University of London, University of California, Los Angeles, Kuwait University, Rockefeller University, New York, or within organisations such as the Max Planck Society, Cancer Research UK and the Defence Science and Technology Laboratory. Others are employed as senior scientists within industry.

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**Related departments**

- Cell and Developmental Biology, page 87
- Genetics, Evolution and Environment, page 88
- History of Medicine, page 89
- Structural and Molecular Biology, page 91

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**Contact details**

Mrs Tina Bashford
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TEL +44 (0)20 7679 2013

**Tuition fees**

Up-to-date tuition fee information is available at [www.ucl.ac.uk/current-students/money](http://www.ucl.ac.uk/current-students/money)

**Funding**

Across the division there are three Welcome Trust four-year programmes and one MRC four-year programme; MRC, BBSRC four-year PhD, BBSRC quota and CASE three- and four-year studentships; NERC; and others. There may also be funding opportunities through individual research grants as well as through other programmes such as those offered by CoMPLEX.

Further information on pages 26–31
The Institute of Structural and Molecular Biology provides a stimulating and intellectually challenging environment in which the molecular basis of biological processes can be understood.

We are equipped with state-of-the-art facilities in areas such as X-ray crystallography, nuclear magnetic resonance spectroscopy, cryo-electron microscopy, biophysical and biochemical analysis, protein expression, purification and molecular and cell biology.

Our research is enhanced by regular lectures from world-leading scientists and focused symposia.

Research staff are world leaders in areas such as bacterial secretion, ageing, intracellular signal transduction, limb regeneration, and cell protein trafficking.

Research areas are:

- Bioinformatics
- Molecular cell biology and metabolism
- Molecular microbiology
- Structural biology and molecular biophysics.

Entry requirements

A minimum of an upper second-class Bachelor’s degree in Biochemistry, Chemical Biology, Molecular Biology, Physics or Chemistry from a UK university, or an overseas qualification of an equivalent standard.

Career prospects

Recent graduates have become researchers at leading UK and international universities including Cambridge, UCL, King’s College London, University of Manchester, University of the Western Cape, Cornell, Yale and other organisations including the Howard Hughes Medical Institute, the Wellcome Trust, Cancer Research UK, Novartis and Breakthrough Breast Cancer. Others have gained employment in the civil service, NHS or found senior roles in industry with companies such as Cellzoe and Genzyme.
The school is home to 11 specialist research centres and the first Global International Federation (FIP) Collaborating Centre in partnership with WHO and UNESCO.

We have invested £6 million in research facilities in the past six years.

Our seven storey 980m² Molecular Pharmacy wing allows scientists from across all the pharmaceutical sciences to collaborate on research.

In 2010/11, the school received £8.1 million in research grants and contracts.

Entry requirements

A UK taught Master's degree, or a minimum of an upper second-class UK Bachelor's degree in pharmacy or an overseas qualification of an equivalent standard.

Clinical Pharmacy, International Practice and Policy MSc: a minimum of a second-class UK Bachelor's degree in pharmacy, pharmaceutical sciences, pharmacology, physiology, physical science, biochemistry, biotechnology, chemistry, chemical engineering, genetics, materials science, medicine or a related field, or an overseas qualification of an equivalent standard.

All other MSc programmes: a minimum of a second-class UK Bachelor's degree in pharmacy or pharmaceutical, chemical, biological or medical sciences, or a related field.

Career prospects

Graduates have found employment in quality assurance for a major pharmaceutical company, as analytical chemists, research scientists for a medical research charity and in universities across the world, while others have found work in regulatory affairs. Others have gone on to start PhD programmes at UCL and at other UK, US and European universities.

Graduates from the Clinical Pharmacy, International Practice and Policy MSc have found employment as senior pharmacists in hospitals around the world, from Brunei to Kenya, Saudi Arabia to Slovenia, while others moved into teaching and research, in London and around the world.

Contact details

Research programmes:
Mr Berni Widemann
EMAIL b.widemann@ucl.ac.uk
TEL +44 (0)20 7753 5958

Taught programmes:
Mr Patrick Barnett
EMAIL p.barnett@ucl.ac.uk
TEL +44 (0)20 7753 5958

Research Assessment 2008
65% rated 4* or 3* (see page 5)

The MSc in Clinical Pharmacy, International Practice and Policy not only taught courses but also provided clinical and research experiences at some teaching hospitals. I received funding from the Ministry of Education and Culture Republic of Indonesia – Directorate General of Higher Education for the Foreign Affairs Scholarship S2/S3, which enabled me to undertake an MSc at the UCL School of Pharmacy. They provided funding for tuition fees, monthly living expenses, personal insurance, and return flights. The MSc has equipped me with knowledge and skills in pharmacy services. Therefore, after completing the programme I will return to Indonesia and apply this knowledge to improve my teaching practice at my university as well as to develop clinical pharmacy practice in the university’s hospital.

The MSc has equipped me with knowledge and skills in pharmacy services. Therefore, after completing the programme I will return to Indonesia and apply this knowledge to improve my teaching practice at my university as well as to develop clinical pharmacy practice in the university’s hospital.
The Gatsby Unit is a world-class centre for theoretical neuroscience and machine learning.

We provide a unique opportunity for a critical mass of theoreticians to interact closely with each other and with other world-class research groups across UCL.

Teaching is supplemented through regular research talks, journal clubs and reading groups, extensive seminar programmes and participation in international conferences.

As a student you will have ready access to all members of academic staff, not just your immediate supervisors.

The four-year MPhil/PhD programme commences with a compulsory year of intensive instruction in techniques and research in theoretical neuroscience and machine learning. After this taught year, students generally choose to concentrate in one of these two fields.

The main research areas within the unit are:
- Analysis of neural data
- Neural dynamics
- Perceptual processing of auditory and visual input
- Population coding
- Reinforcement learning
- Statistical machine learning
- Unsupervised learning.

Entry requirements
Applicants must have a strong analytical background, a keen interest in neuroscience or machine learning and a relevant first degree at a minimum of upper second-class UK Bachelor’s level or an overseas equivalent, for example in computer science, engineering, mathematics, neuroscience, physics, psychology or statistics. Students seeking to combine work in neuroscience and machine learning are particularly encouraged to apply.

Career prospects
Recent graduates have taken up postdoctoral positions at institutions such as the Universities of Cambridge, Toronto and Columbia and organisations including Microsoft Research.

Ritwik Niyogi
Computational Neuroscience PhD

I received several offers from both the US and UK but the Gatsby Computational Neuroscience Unit is (in my opinion) the best in the world. UCL’s status as a powerhouse in neuroscience, the world-famous neuroscience community of Queen Square, and the opportunity to live in the global capital was simply too tempting to resist – a once-in-a-lifetime ticket to being world-class. I use all the facilities at Queen Square very often; the library’s access to journals is awesome. I live in Ann Stephenson House, close to my office in Russell Square and all that for a remarkably low price. You don’t get that outside UCL.

Contact details
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TEL +44 (0)20 7679 1176

Tuition fees
Up-to-date tuition fee information is available at www.ucl.ac.uk/current-students/money

Funding
A number of competitive fully-funded PhD studentships are available each year. These cover payment of full fees, provide a generous stipend and are available to students of any nationality.

Related departments
Clinical, Educational and Health Psychology, page 57
Institute of Cognitive Neuroscience, page 58
Computer Science, page 77
Neurology, page 54
Ophthalmology, page 55
Physics and Astronomy, page 99
Statistical Science, page 102
Katrina Lester
Molecular Cell Biology PhD

I love living in a city and studying here, where there is such a broad and vast scientific community. This has enabled me to foster collaborative projects with laboratories at the Royal Free Hospital and Imperial College London, which have greatly advanced my PhD thesis. My PhD is funded by the Medical Research Council (MRC). I was accepted onto the graduate programme of the LMCB, which has six places funded annually by the MRC. The MRC therefore pays my tuition fees and grants me an annual stipend, for which I am extremely grateful. Outside of the lab I am a keen runner. I used to be a member of the gym but now I have ventured off the treadmill and taken to the streets. The close proximity of UCL to Regent’s Park means I can easily go running after work.

Labaratory for Molecular Cell Biology

The Laboratory for Molecular Cell Biology (LMCB) at UCL is a Medical Research Council-funded institute dedicated to research aimed at understanding the molecular and cellular basis of cell behaviour relevant to human disease.

The four-year Molecular Cell Biology PhD programme we offer provides a broad training in fundamental aspects of biomedical science.

The programme provides the opportunity to carry out cutting-edge research in an internationally competitive environment.

In the first year of your PhD you will rotate through three laboratories of your choice, selected from projects offered by the 40 or so laboratories participating in the programme. You then choose any one of these laboratories for your three-year thesis project. The first year of the programme also includes weekly tutorials run by experts in various fields of cell and molecular biology, as well as practical training, discussion sessions and debates on wider issues in science. This crucial first year allows you to broaden your understanding of cell biology and biomedical science and, most importantly, to sample different laboratories in order to make an informed choice of thesis area and mentor.

Research areas are:
- Cancer
- Cell cycle
- Cell migration
- Cytoskeleton
- Haemostasis
- Infection and immunity
- Inflammation
- Morphogenesis and polarity
- Neuronal cell biology
- Signalling
- Trafficking
- Vision.

Entry requirements
A minimum of an upper second-class UK Bachelor’s degree in a relevant discipline or an overseas qualification of an equivalent standard.

Career prospects
Recent graduates have secured positions as research fellows and postdoctoral researchers at leading UK universities including Cambridge and UCL and for overseas organisations such as Memorial Sloane-Kettering Cancer Center, USA and the Agency for Science Technology and Research (A*STAR), Singapore.

Tuition fees
Up-to-date tuition fee information is available at www.ucl.ac.uk/current-students/money

Funding
Six MRC studentships are available to UK/EU students.

Further information on pages 26–31

Related departments
Ear Institute, page 52
Infection and Immunity, page 109
Neurology, page 54
Ophthalmology, page 55
Wolfson Institute for Biomedical Research, page 113