

Medical Biochemistry BSc (Hons)



The point where chemistry, biology and medicine meet, biochemistry deals with the molecular nuts and bolts of living organisms and diseases. Advances in the biosciences are having a profound impact on our daily lives, from human health to conservation, making it a hugely rewarding area to study and work in. Studying at Birmingham means you'll benefit from high-technology facilities and teaching from world-renowned experts in their field. This flexible course provides you with the opportunity to tailor a degree to match your own interests and goals, and have the unprecedented opportunity to join one of our research groups, working on live research projects. The course combines practical work and theory allowing you to develop a wide range of skills and knowledge.

“ 2013 National Student Survey "100% of students said that overall they were satisfied with the quality of our Biochemistry courses" ”

This programme has been accredited by the Society of Biology. Accredited degree programmes contain a solid academic foundation in biological knowledge and key skills, and prepare graduates to address the needs of employers.



Study here and find out why the University of Birmingham was awarded The Times and The Sunday Times University of the Year 2013-14
<http://www.birmingham.ac.uk/news/latest/2013/09/20-sep-Birmingham-announced-as-University-of-the-Year.aspx>

Course fact file

UCAS code: C720

Duration: 3 years

Places Available: 205 (Total number of places for all undergraduate courses in the school)

Applications in 2012: 1399

Typical Offer: AAB (**More detailed entry requirements and the international qualifications accepted can be found in the course details (? OpenSection=EntryRequirements)**.)

Start date: September

Contact

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[School of Biosciences \(/schools/biosciences/index.aspx\)](http://www.birmingham.ac.uk/schools/biosciences/index.aspx)

Details

Biochemistry makes an impact on many fronts, offering graduates exciting and varied careers. This is a flexible degree, with the opportunity to specialise in areas such as medical biochemistry, genetics, biotechnology and molecular cell biology, providing ample scope to tailor a programme of study that matches individual interests and goals. The course particularly emphasises practical training and the development of transferable skills that can be deployed in a wide range of professional settings.



My degree gave me my core scientific understanding and practical lab skills, which allowed my entry to the medical device industry.



Hannah Murfet
Optasia Medical



[\(/schools/biosciences/our-students/murfet-hannah.aspx\)](http://www.birmingham.ac.uk/schools/biosciences/our-students/murfet-hannah.aspx)

Course structure

A list of course modules can be found in the **BSc Medical Biochemistry - Course modules section**
<http://www.birmingham.ac.uk/students/courses/undergraduate/biosciences/medical-biochemistry.aspx?OpenSection=Modules> .

First year

Up to a third of the time will be spent doing practical work. This hands-on experience in the laboratory, in part working with living organisms, will greatly enhance the understanding of central biochemical concepts.

Second year

A set of core modules in biochemistry and chemistry, complemented with elective modules allows you to follow your particular interests.

Third year

In addition to two core modules, you will have the choice between some 15 specialist modules. The topics of these modules draw on the research interests and academic expertise of our staff, and reflect exciting developments in the field of biochemistry.

Central to final-year studies is the research project, which makes up one-sixth of the final year. We offer you the opportunity to join one of our research groups, of which there are almost 60, providing the fascinating prospect to experience research at first hand and to contribute to the current research projects in the department. Project work does not necessarily mean you are in the laboratory; some students will do computer-based projects, others carry out a detailed analysis of the research literature in a particular area.

“ Professor Bob Michell, FRS, Royal Society Research Professor, School of Biosciences

"When I came to study Medical Biochemistry at Birmingham, I had no idea that almost half a century later I would still be researching and teaching here. Relatively little of what we now teach students was then known, so I have had a wonderful time trying to fill some of those gaps – but there is plenty still to learn!"

Which courses should I apply for?

Applicants may apply either for the main programme (C700 Biochemistry) or for one of the specialist degree labels (for instance C720 Medical Biochemistry). The selection criteria are identical in either case. The design of our courses allows students to delay specialisation until the second year or to transfer between specialisations as interests develop or change.

Why study this course

Biochemistry is a science subject at the interface between Biology, Chemistry and Medicine. If you are fascinated by the molecular world, and wish to pursue a career in an area with a direct and growing impact on key societal issues, Biochemistry is a great place to start.

The Biochemistry degree course, with its specialist degree options, offers a fantastic opportunity to explore living organisms from a molecular and cellular perspective. We start with the foundations of chemistry, cell biology and genetics and lead you right up to cutting-edge research questions in the final year.

With a Biochemistry degree, you will acquire a wide range of skills, with particular emphasis on data analysis, experimental design and problem solving. Skills acquired in this course enable careers not just in the life science, but across a wide range of professions. Most important of all, Biochemistry has many facets. Check out our collection of [related research stories](http://www.birmingham.ac.uk/schools/biosciences/research/showcase/explore.aspx) (<http://www.birmingham.ac.uk/schools/biosciences/research/showcase/explore.aspx>).



“ 2013 National Student Survey "100% of students said that overall they were satisfied with the quality of our Biochemistry courses"

Modules

After a common first year for all Biochemistry undergraduates, students undertaking Medical Biochemistry will study a variety of biomedically related topics such as immunology, human physiology, biochemical pharmacology, molecular endocrinology and neurobiology. In the final year, students will undertake modules that reflect recent advances in biomedical sciences, which include Mechanisms of Toxicity and Human Disease Processes; Cellular Signalling; Cancer Biology and Molecular and Cellular Immunology.

For more detailed descriptions of individual modules, download [Biochemistry Module Descriptions \(PDF 348KB\) \(/Documents/colleges/biosciences/BiochemistryModuleDescriptions\(PDF128KB\).pdf\)](#)

First Year

The first year core modules include:

- Cell Biology & Physiology
- Genetics I
- Chemistry
- Enzymes and Metabolism
- Biochemistry
- Physical Biochemistry



“ Professor Bob Michell, Royal Society Research Professor "When I came to study Medical Biochemistry at Birmingham, I had no idea that almost half a century later I would still be researching and teaching here. Relatively little of what we now teach students was then known, so I have had a wonderful time trying to fill some of those gaps – but there is plenty still to learn!"

Second Year

A set of core modules in biochemistry and chemistry, complemented with elective modules allows you to follow your particular interests. The following modules are available:

- Core skills in Biosciences
- Chemistry
- Molecular biology and its applications
- Proteins and enzymes
- Membranes, Energy and Metabolism
- Genetics II
- Topics in Medical Biosciences
- Developmental Biology
- Microbes and Man
- Cell biology



Final Year

In addition to two core modules, you will have the choice between some 15 specialist modules. The topics of these modules draw on the research interests and academic expertise of our staff, and reflect exciting developments in the field of biochemistry. Students of the Medical Biochemistry degree course must cover at least three of the following modules:



- Mechanisms of Toxicity and Disease
- Molecular Basis of Bacterial Infection
- Structures of Destruction
- Cellular Signalling
- Eukaryotic Gene Expression
- Omics – exploiting genomic data
- Cellular Neurobiology
- Human Reproductive Biology and Development
- Cancer Biology
- Molecular and Cellular Immunology



Other final year modules include:

- Advanced Topics in Biochemistry
- Biochemical Data Analysis and Interpretation
- Applied and Environmental Microbiology
- Prokaryotic Gene Regulation
- Genetic Variation in Humans and other Eukaryotes
- Plant Cell Biology and Development

Fees and funding

Standard fees (<http://www.birmingham.ac.uk/students/ug/courses/fees/standard>) apply

Learn more about **fees and funding** (</undergraduate/fees/loans.aspx>)

Scholarships

Learn more about our **scholarships and awards** (</undergraduate/fees/funding/index.aspx>)

Entry requirements

Number of A levels required: 3

Typical offer: AAB

Required subjects and grades: Chemistry A level and one other from Biology/Human Biology, Computer Science, Environmental Studies, Geography, Geology, ICT, Maths, Physics, Psychology or Sports Studies/PE. Five GCSEs at grade C (minimum) in Double Award/Integrated Science, English and Mathematics.

General Studies: We do not accept General Studies, Critical Thinking, Citizenship Studies, Applied Science, Communication and Culture, Critical Studies, Global Perspectives, Science in Society and World Development.

Additional information:

BTEC Level 3 Extended Diploma (Applied Science) is accepted only in combination with a science subject at GCE A2 level at grade B or better. Other qualifications are considered – learn more about **entry requirements** (<http://www.birmingham.ac.uk/students/ug/requirements>)

International students:

International Baccalaureate Diploma: 34-35 points excluding bonus points from TOK and Extended Essay. 6, 5, 5 at HL to include Chemistry and one other science at HL. 5 points in each of SL English and Maths if not offered at GCSE or equivalent.

Standard English language requirements apply

Learn more about **international entry requirements** (<http://www.birmingham.ac.uk/students/ug/requirements/international>)

Depending on your chosen course of study, you may also be interested in the Birmingham Foundation Academy, a specially structured programme for international students whose qualifications are not accepted for direct entry to UK universities. Further details can be found on the **foundation academy web pages** (<http://www.birmingham.ac.uk/students/foundation-academy/Pathways/index.aspx>).

How to apply

Apply through UCAS at www.ucas.com (<http://www.ucas.com/>)

Learn more about **applying** (<http://www.birmingham.ac.uk/students/ug/courses/apply>)

Key Information Set (KIS)

Key Information Sets (KIS) are comparable sets of information about full- or part-time undergraduate courses and are designed to meet the information needs of prospective students.

All KIS information has been published on the Unistats website and can also be accessed via the small advert, or 'widget', below. On the **Unistats website** (<http://unistats.direct.gov.uk>) you are able to compare all the KIS data for each course with data for other courses.

The development of Key Information Sets (KIS) formed part of HEFCE's work to enhance the information that is available about higher education. They give you access to reliable and comparable information in order to help you make informed decisions about what and where to study.

The KIS contains information which prospective students have identified as useful, such as student satisfaction, graduate outcomes, learning and teaching activities, assessment methods, tuition fees and student finance, accommodation and professional accreditation.

Related links

[Biochemistry BSc \(Hons\) \(/undergraduate/courses/biosciences/biochemistry.aspx\)](/undergraduate/courses/biosciences/biochemistry.aspx)

[Biochemistry MSci \(Hons\) \(/undergraduate/courses/biosciences/biochemistry-msci.aspx\)](/undergraduate/courses/biosciences/biochemistry-msci.aspx)

[Undergraduate courses - School of Biosciences - Study here for your Bsc degree \(/schools/biosciences/courses/undergraduate/index.aspx\)](/schools/biosciences/courses/undergraduate/index.aspx)

[Biochemistry Module Descriptions \(PDF 128Kb\) \(/Documents/college-les/biosciences/BiochemistryModuleDescriptions\(PDF128KB\).pdf\)](/Documents/college-les/biosciences/BiochemistryModuleDescriptions(PDF128KB).pdf)

Learning and teaching

As a Birmingham student you are part of an academic research elite and will learn from world-leading experts. From the outset you will be encouraged to become an independent thinker, discussing, analysing and evaluating various aspects of Biology in partnership with the staff who will be involved in every step of your learning.

- **Lectures** - Your learning will take place in a range of different settings, from scheduled teaching in lectures and small group tutorials, to self-study and peer group learning. As well as traditional whiteboard and pen, our lecture theatres are equipped with the latest technology including movies and animations, molecular graphics and 'ask the audience' style electronic voting systems. Student interaction with staff is encouraged before, during and after lectures particularly using social media.
- **Practical classes** - Laboratory-based practical work is an integral part of our degree. A typical practical session will last 3 hours allowing you to complete the work at your own pace. In addition to gaining important transferable skills, experience of practical work is essential if you wish to move into a research career and is valued by a wide range of employers. You will engage with academic and postgraduate researchers who will help you during these practical sessions.
- **Tutorials** - A personal tutorial system is an essential feature of our degree programme and your tutors will help you in three important areas: supporting your academic progress, developing transferable skills and helping with any welfare issues. From the outset, you will be assigned your own Personal Tutor who will get to know you as you progress through your studies, providing academic and welfare advice, encouraging you and offering assistance in any areas you may feel you need extra support to make the most of your potential and your time here at Birmingham.
- **Project (final year)** - A core component of your final year is the project, which principally comes in two forms: as a laboratory-based project or as an extended dissertation. In both situations, a lecturer or professor will guide and advise you. But the principal aim is to lead you to independence as a future graduate in your field.

You will join one of the research groups in the School for the laboratory-based project, and you will work on a topic or question that draws on current research activity. You will receive training in relevant lab techniques and you will have to document your work and its results in a thesis-like report.

The dissertation project asks you to explore the research literature in a narrowly defined area of scholarship, with three aims: one, to write a comprehensive review of that area, two, to explore analyse a small set of articles in depth, and three, to develop a new research proposal from your review and in-depth analysis.

To begin with you may find university level education challenging, but we will support you to enable you to make this transition. You will have access to a comprehensive support system in the School, including personal tutors and welfare tutors, who can help with both academic and welfare issues throughout your course. You will have a formal transition review during your first year to check on your progress and identify areas where you may need some additional support, and the School's academic small group tutorial system will provide you with skills based support throughout the course.

Our **Academic Skills Centre** (<https://intranet.birmingham.ac.uk/as/libraryservices/asc/index.aspx>) also offers you support with your learning. The centre is a place where you can develop your mathematical, academic writing and general academic skills. It is the centre's aim to help you to become a more effective and independent learner through the use of a range of high-quality and appropriate learning support services. These range from one-to-one support with mathematics and statistics based problems from experienced mathematicians, to workshops on a range of topics including note taking, reading, writing and presentation skills.

Assessment methods

Studying at degree-level is likely to develop in different ways from your previous experience of learning and teaching. As well as remembering biochemical facts you will learn how to demonstrate real understanding as you apply your knowledge to analyse and evaluate scientific information. Our ultimate aim is to help you develop into a skilled and creative biochemist. Each module is assessed separately and you will be assessed in a variety of different ways. All modules contain some continuous assessment, that is, assessment taking place during the teaching period. Continuous assessment generally accounts for over one-third of the mark for a given module, while the remainder are contributed by the end-of-year examination in the summer term. A subset of modules are assessed through course work, without an end-of-year examination.

At the beginning of each module, you'll be given information on how and when you'll be assessed for that particular programme of study. You'll receive feedback on each assessment within four weeks, so that you can learn from and build on what you have done. You'll be given feedback on any exams that you take; if you should fail an exam we will ensure that particularly detailed feedback is made available to enable you to learn for the future.

More information about assessment methods and feedback is given below:

- **Feedback** - Feedback - You will be able to track how your learning is developing by using a wide range of types of feedback. These include: written feedback on your scripts, formative tests (these do not count in your final degree mark), class feedback question sessions, discussions with each other and your tutor. .
- **Examinations** ? The formal end-of-year examinations (in May/June of each year) are complemented by course work in the form of essays or reports, data handling or interpretation exercises, poster presentations, seminar presentations, group work and lab reports.
- **Projects and dissertations** ? You will choose the topic of your project from a wide range of titles. We offer a range of projects including practical work in the laboratory, field work, computer based projects, or literature reviews. Projects allow you to demonstrate the full range of academic and transferable skills you have developed and provide a stepping stone to into research and other careers. .

Employability

Top career prospects for our Biosciences Graduates - Only Cambridge can offer better!

Graduates of the University of Birmingham are highly regarded among employers in the UK, and a Biochemistry degree from Birmingham is an excellent qualification for securing your future career in a diverse range of industries and employment sectors. Whether you have a clear idea of where your future aspirations lie or want to consider the broad range of opportunities available once you have a Birmingham degree, our Careers and Employability Service can help you achieve your goal

Advances in the biosciences are having a profound impact on our daily lives in areas from human health to conservation. Biotechnology, biological pharmaceuticals, and personalised medicine are key growth areas in the health sector. Over the next decade our increasing understanding of how genomes are regulated will revolutionise how we interact with the natural world. Environmental remediation, climate change and related themes pose multi-faceted challenges for the coming decades. Expert knowledge in biology and the life sciences will be in high demand for the foreseeable future, with excellent prospects for exciting and rewarding careers in research, education, media, industry, the NHS and the public sector.

A significant number of our graduates choose to take a further degree, a Masters or PhD. For many career paths, a further degree is an essential stepping-stone, including (but not limited to) careers in research. While many of our graduates remain in Birmingham and join one of our prestigious research groups, they are also highly sought after by universities around the world.

In order to help you build an attractive CV, bursaries from the University can help fund a summer internship in a research laboratory or in a company. Also, you can apply for one of the highly prestigious (and competitive) **Alumni Leadership Mentoring** (<http://www.birmingham.ac.uk/generic/internships/mentoring/almpp.aspx>) or **Global Challenge programmes** (<http://www.birmingham.ac.uk/generic/internships/opportunities/globalchallenge/index.aspx>) of the University, which provide unique



Take a virtual tour of one of our teaching labs
(<http://www.birmingham.ac.uk/schools/bioscience/lab.aspx>)

First destinations of University of Birmingham Biosciences graduates six months after graduation



- Working (46.2%)
- Studying (35.6%)
- Looking for work (5.7%)
- Work/Study (8.9%)

opportunities to see top notch organisations from an inside perspective. Furthermore, the Personal Skills Award (PSA) scheme gives formal recognition to skills you acquired outside the course, for instance when volunteering for a charity or taking on responsibility within the Guild of Students. We also offer 4-year course options (MSci, Professional Placement, Year Abroad) which are key to giving you a professional edge in a highly competitive job market.

■ Other (1.6%)
Destinations of Leavers of Higher Education report (DHLE) 2012/13

Helping you find the right career

The University and the School of Biosciences provide a range of services to support you in finding a career and to build a CV that stands out from the crowd. Our skills modules and tutorials develop your career skills and are fully integrated with Careers Network, the University's careers advice service. During term time, professional career advisers hold weekly drop-in sessions, discussing with you how to prepare a CV and cover letters, the graduate application process and how to explore possible career paths. Talks and presentations by external life sciences professionals are embedded in academic modules. These individuals are either Birmingham alumni or have professional links to the University, and you will learn about their career path and experience.

Our unique careers guidance service is tailored to your academic subject area. Our team source exclusive **work experience opportunities** (<http://www.birmingham.ac.uk/students/careers/work-experience.aspx>) to help you stand out amongst the competition, with **mentoring** (<http://www.birmingham.ac.uk/generic/internships/mentoring/index.aspx>), **global internships** (<http://www.birmingham.ac.uk/generic/internships/index.aspx>) and placements available to you. Once you have a career in your sights, one-to-one support with CV?s and job applications will help give you the edge. In addition, our employer-endorsed award-winning **Personal Skills Award (PSA)** (<http://www.birmingham.ac.uk/students/careers/psa.aspx>) recognises your extra-curricular activities, and provides an accredited employability programme designed to improve your career prospects.

Professional accreditation

This programme has been accredited by the Society of Biology following an independent and rigorous assessment. Accredited degree programmes contain a solid academic foundation in biological knowledge and key skills, and prepare graduates to address the needs of employers. The accreditation criteria require evidence that graduates from accredited programmes meet defined sets of learning outcomes, including subject knowledge, technical ability and transferable skills.



93% Students agreed staff are good at explaining things	To see more details and compare with other courses
BSc (Hons) Medical Biochemistry Full time	Official data collected by HEFCE

