

# Cellular and Molecular Pharmacology

*This version of the programme is no longer recruiting. Please see the specification for MSc Pharmacology.*

<b>Final award</b>	MSc
<b>Intermediate awards available</b>	PgCert, PgDip
<b>UCAS code</b>	N/A
<b>Details of professional body accreditation</b>	N/A
<b>Relevant QAA Benchmark statements</b>	Biosciences
<b>Date specification last up-dated</b>	March 2010

## Profile

### The summary - programme advertising leaflet

#### Programme content

This modular programme aims to enable postgraduate students to gain a detailed understanding of both practical and theoretical aspects of cellular and molecular pharmacology and equip them with the necessary skills to undertake individual and collaborative research in pharmacology. The programme will enable students to pursue a career in pharmacological research allied to drug development with global pharmaceutical companies, small-medium biotechnological enterprises, government funded research institutes and laboratories. Pharmacology is at the interface of biochemistry, human physiology, neurochemistry and drug discovery, all of which will be studied in the degree programme. The programme offers the opportunity not only to explore novel drug discovery technologies but also offers routes into traditional pharmacology. In addition, this programme will make use of recent research papers to inform group discussion and enhance critical thinking skills. Apart from taught modules in the programme, the student will also be trained in research from concept to delivery, culminating in an individual research project, which will foster independent laboratory study and ability. Students will study:

#### Advanced Cellular Pharmacology and Physiology

Understanding of concepts and mechanisms in cardiovascular, gastrointestinal and immunopharmacology with emphasis on cellular and molecular mechanisms. How current concepts in cellular pharmacology have evolved and their relevance in the clinical setting. Immunopharmacology is introduced with particular attention to the cellular mechanisms of inflammation.

#### Research Skills for Pharmacology and Physiology

Introduces students to research concepts and methods in Pharmacology and Physiology. In addition, the underlying principles of research planning and design, data collection methods, statistical, computer analysis and communication skills are addressed.

## **Psychopharmacology and Integrative Systems**

Introduction of concepts and current theories of psychopharmacology and other related systems. Students will be introduced how current concepts in psychopharmacology have been adopted for use in the clinical setting.

## **Molecular Pharmacology and Drug Development**

Discussion of concepts and current theories of molecular pharmacology and drug development with focus on traditional molecular pharmacology and drug delivery processes. Traditional molecular pharmacology is introduced from concepts of ion channel activation to exploitation as drug targets. This module has been designed to cater for the needs of the pharmaceutical industry.

## **Research Project**

Experimental laboratory-based projects are preferred, although there is an option to do a literature-based project. This module requires a written report, oral presentation and contemporaneous project notebook. With negotiation the research project could be conducted in the workplace.

## **MSc Cellular and Molecular pharmacology at UEL**

This modular programme aims to produce postgraduate students with a sound knowledge of both the practical and theoretical aspects of Pharmacology, and the necessary skills to undertake individual and collaborative research. All modules are obligatory core modules and students take two specialist subject modules in semester A, two specialist modules in semester B and a module in research during the summer.

## **Admission requirements**

For entry to this programme, students are required to have a minimum of a second class undergraduate degree from a UK university in a relevant subject e.g. Pharmacology or Physiology. Applicants whose qualifications do not conform to these criteria may be admitted to the programme at the admission tutors discretion which will normally involve an interview.

In the case of applicants whose first language is not English, then IELTS 6.5 (or equivalent) is required. International qualifications will be checked for appropriate matriculation to UK Higher Education postgraduate programmes.

Students that apply to enter stages of the programme may be admitted through normal Accreditation of Experiential Learning (AEL) or Accreditation of Certificated Learning (ACL) processes, or through an approved articulation agreement. Therefore such applicants must be able to demonstrate and evidence that they have the required learning outcomes as listed in the modules for which they are seeking exemption.

## **Programme structure**

- One year full time or two years part time for MSc and PG Diploma (PG Diploma is only available as an intermediate award).
- One year part time for PG Certificate (only available as an intermediate award).
- Part time students take the research skills in pharmacology and physiology module in semester A and one core module in semester B of year one. In year two they take one core module in semester A and another core module in semester B. The project is carried out in year 2.
- Taught modules are delivered in a semesterised system, with semesters running from September to January and February to June.
- Students will need to pass research skills in Pharmacology and Physiology (Semester A) to be able to undertake the individual research project.
- The research projects will run through the summer period

### **Learning environment**

- Learning is encouraged through participation in a wide variety of activities including lectures, seminars, workshops, laboratory-based practicals, web-based learning etc.
- In addition all students are expected to read extensively in their own time and get up to speed on current issues in Cellular and Molecular Pharmacology.
- Success at university depends on developing your ability to study independently using library resources, Computer-assisted learning (CAL), handouts and web-based study activities.
- These skills are reinforced in modules in the first semester. These enable us to assess your independent learning needs at university, and also help to develop those transferable skills so important in working life. The skills with which you start the programme may vary considerably between individuals, so your personal tutor will direct your skills development work on an individual basis.

### **Assessment**

- Students are assessed in practical work and theory.
- In taught modules Advanced Cellular Pharmacology & Physiology and Psychopharmacology and Integrative Systems 50% of the module mark is derived from a theoretical practical examination. The remaining 50% from written theory examination at the end of the semester.
- In the taught module, Molecular Pharmacology and Drug Development, 50% of the module mark is derived from a dissertation and the other 50% from a critique of a journal paper.
- The Research Skills module in semester A (Research skills in Pharmacology and Physiology) is assessed by a research proposal (50%) and laboratory skills (50%).
- The Research Project is assessed mainly by the final written report, with contributions from a poster presentation and portfolio.
- The pass mark for all modules is 50%.

### **Relevance to work/profession**

- The curriculum is tailored to current demand in pharmacology and related areas such as drug discovery and novel technologies.
- Emphasis is placed on the development of critical thinking skills as well as academic knowledge.

- Part-time students in relevant employment may be permitted to carry out research projects at their place of work.

### **Thesis/Dissertation/project work**

- Project work is an essential component of the Masters degree programme and one that most students enjoy. Small projects and group work exercises feature throughout the programme and the students will be given a thorough grounding in how to plan and execute pharmacological research.
- The individual research project is the culmination of the programme makes up 33% of the programme.
- Project work encourages students to show initiative in their individual work and enhance their critical thinking skills, and under supervision to use appropriate pharmacological techniques to generate and analyse experimental data.
- Dissertation preparation develops literature researching and written communication skills essential in professional development.

### **Added value**

- Extensive personal support throughout the programme.
- Staff with extensive experience of teaching students from a wide range of backgrounds.
- Sound practical as well as academic training.
- Access to modern research facilities.
- Effective careers advice and support available.

### **Your future career**

Most graduates would be expected to pursue research careers in the Pharmaceutical Industry, in the National Health Service or Health Protection Agency, environmental monitoring, in academic research in Universities, research institutes etc. Many students will acquire sufficient knowledge to allow them to go on to laboratory based careers. This degree can also be utilised by those students who would like to pursue a doctorate in areas allied to cellular and molecular pharmacology such as basic translational research into ion channels and the drug discovery processes.

### **How we support you**

The School of Health and Bioscience provides immediate contact with University support systems.

- When you arrive, you will be allocated a Personal Tutor (a member of staff familiar with your degree). You will see your Tutor at regular intervals to discuss progress and life in general. Your tutor will be responsible for directing your skills development work, by directing you to programmes which will tackle any areas in which your academic background may be deficient.
- The programme tutor may also give support on academic matters, and advice about other specialist help available through the University.
- The School also has a Help Desk to provide administrative assistance and advise how to get the right help.

- Internet homepages are used by many staff to support their teaching and your learning.
- Lecture and practical files, quizzes, mark summaries and much more is now available for all modules through UELPlus and UELDirect programme links.

Throughout the programme you will find a number of scheduled support activities devoted to specific aspects e.g. how to write your project report, or more general aspects such as careers. Support for students on a **University level** includes:

- Libraries and Learning Resource Centres
- Careers advice and information · Counselling and Advice for practical problems
- Health Centre with a nurse regularly on duty.
- Language tuition
- Dyslexia support
- Accommodation

### **Bonus factors**

- A small and friendly campus.
- A School with staff and facilities to match to the wide interests and backgrounds of students.
- Good connections with the Pharmaceutical industry, NHS and other employers.
- Sports facilities at the Atherton Centre, which is just a few minutes walk away. The University and Sports Science in the School of Health and Bioscience have excellent links with the Olympic Development in Stratford, and are expected to benefit from this legacy after 2012 Olympics.
- Multiplex cinema, theatre, supermarkets, high street shops, restaurants, cafes and pubs a few minutes walk away in Stratford. The vast retail and leisure development named Stratford City is due to open in 2011.
- Central London only 20 minutes away by underground and extensive transport links with all parts of London and further a field. The Channel Link rail station is due to open in 2011, providing a rapid link with continental Europe.

## **Outcomes**

### **Programme aims and learning outcomes**

#### **What is this programme designed to achieve?**

This programme is designed to give you the opportunity to:

- Demonstrate an in-depth knowledge of specialised areas of Pharmacology and have an appreciation of the current range of theoretical and research understanding in those areas.
- Create, design and explore a research question in a specialised area of Pharmacology and evaluate this research with appropriate justification or create, design and explore a work-based learning project to evaluate an issue in practice.

- Have a systematic awareness of knowledge and a critical awareness of current problems and new insights, much of which is at, or informed by, the forefront of Pharmacology, translational medicine and drug development.
- Have a comprehensive understanding of the latest research techniques used in the Pharmaceutical industry.
- Communicate effectively with a wide range of audiences using a variety of methods including written and oral presentations.
- Design and develop high quality dissertation and research proposal and present it in a suitable form.

## **What will you learn?**

### **Knowledge**

- An in-depth knowledge of cellular and molecular pharmacology including themes in traditional pharmacology to cutting edge technologies used in the pharmaceutical industry.
- A detailed appreciation of the current theories and research developments in Pharmacology.
- An awareness of pharmaceutical research and its importance in drug development.
- Understanding of the laboratory procedures and techniques used, which will allow the rapid acquisition of more specialist skills later in their career.
- An awareness of the wider implications of scientific research on society as a whole.

### **Thinking skills**

- The ability to use integrated approaches to analyse and interpret complex and contradictory scientific information autonomously and to accurately assess and criticise your own and others' work.
- An awareness and understanding of the ethical constraints associated within the field of Pharmacology and the ability to relate these to your own experience.
- The ability to contribute to the development of the subject through applied study or research
- The ability to think creatively to analyse and solve problems in science.

### **Subject-Based Practical skills**

- The ability to select and apply a range of practical skills relevant to cellular and molecular Pharmacology.
- A higher level of competence in laboratory skills in Pharmacology.
- An ability to isolate, assess and resolve problems independently and to react effectively to unusual and unexpected situations.
- An improved ability to engage in professional and academic communication with others in the field of pharmacology.
- The ability to select and utilise appropriate computer software, and to understand its limitations in presenting scientific data.

### **Skills for life and work (general skills)**

- Increased ability to take responsibility for your own learning and the ability to work with and motivate others effectively.
- Ability to reflect critically on your own and others' performance resulting in the improvement of subsequent actions.
- Increased confidence in your own abilities.
- Improved skills in written and verbal communication of complex information.

## **Structure**

### **The programme structure**

#### **Introduction**

All programmes are credit-rated to help you to understand the amount and level of study that is needed.

One credit is equal to 10 hours of directed study time (this includes everything you do e.g. lecture, seminar and private study).

Credits are assigned to one of 5 levels:

- 0 - equivalent in standard to GCE 'A' level and is intended to prepare students for year one of an undergraduate degree programme
- 1 - equivalent in standard to the first year of a full-time undergraduate degree programme
- 2 - equivalent in standard to the second year of a full-time undergraduate degree programme
- 3 - equivalent in standard to the third year of a full-time undergraduate degree programme
- M - equivalent in standard to a Masters degree

#### **Credit rating**

The overall credit-rating of this programme is:

Total of 60 or 120 credits at level M are needed for the award of a Postgraduate Certificate or Diploma respectively. A total of 180 credits at level M are needed for the award of an MSc in Cellular and Molecular Pharmacology.

#### **Typical duration**

The typical duration of this programme is one year full-time or two years part-time. It is possible to move from full-time to part-time study and vice-versa to accommodate any external factors such as financial constraints or domestic commitments. Many of our students make use of this flexibility and this may impact on the overall duration of their study period.

#### **How the teaching year is divided**

The teaching year is divided into two semesters of roughly equal length. Teaching and assessment of taught modules is completed within each semester. Having passed the Research skills in Pharmacology and Physiology module in semester A, the research project will be available in the summer period, between June and September. For part-time students, attendance is required on one full-day per week, for full-time students attendance is normally three days but this may be increased during the research project.

### What you will study when

- The order in which modules are taken is important for the students. Students will need to complete the research skills in pharmacology and physiology module (semester A) before the start of the research project in summer. There are no optional modules in either semester.
- Part time students take research skills in pharmacology and physiology module in semester A and one core module in semester B. In year two they take one core module in semester A and another core module in semester B. The project is carried out in year 2. We anticipate that most students taking the part time programme will be in related employment and will be able to devise projects which can be carried out at their place of work. Alternative arrangements will be made individually for students unable to do this, and the project would be taken in the summer period, normally of the second year.
- Full time students complete the whole programme in a single calendar year. The project would be taken in the summer period. Students will be required to take the research skills module in semester A (Research skills in Pharmacology and Physiology) to be able to undertake the research project in the summer. There are no optional modules; 2 core in semester A, 2 core in semester B and research project during the summer.

Level	UEL Module Code	Module Title	Credit	Status
M	BSM018	Advanced Cellular Pharmacology & Physiology	30	Core
M	BSM019	Research Skills for Pharmacology & Physiology	30	Core
M	BSM020	Psychopharmacology & Integrative Systems	30	Core
M	BSM024	Molecular Pharmacology and Drug Development	30	Core
M	BSM003	Research Project	60	Core

### Requirements for gaining an award

- In order to gain a Postgraduate Certificate, you will need to obtain 60 credits at Level M.
- In order to gain a Postgraduate Diploma, you will need to obtain 120 credits at Level M
- In order to obtain a Masters, you will need to obtain 180 credits at Level M. These credits will include a 60 credit level M core module of advanced independent research.

### Masters Award Classification



Where a student is eligible for an Masters award then the award classification is determined by calculating the arithmetic mean of all marks and applying the mark obtained as a percentage, with all decimal points rounded up to the nearest whole number, to the following classification

70% - 100% Distinction

60% - 69% Merit

50% - 59% Pass

0% - 49% Not Passed

## **Assessment**

### **Teaching, learning and assessment**

#### **Teaching and learning**

##### **Knowledge is developed through**

- Lectures
- Seminars and workshops
- Student centred learning – directed reading, assignment preparation

##### **Thinking skills are developed through**

- Tutorials
- Seminars and workshops
- Report writing and assignments
- Project work

##### **Practical skills are developed through**

- Laboratory practical sessions
- Individual research project
- Data analysis exercises
- Use of IT and library based resources
- Student presentations

##### **Skills for life and work (general skills) are developed through**

- Student centred learning
- Seminar and workshop discussions
- Oral and written presentations
- Computer assignments
- Managing time
- Team work

## **Assessment**

### **Assessment will primarily consist of**

- Module examinations and coursework
- A research proposal (2000 words) taken from the skills module in semester A (Research Skills in Pharmacology and Physiology)
- A 9 – 10000 word thesis for the research project module.

### **Knowledge will be assessed by**

- Examinations and coursework (in the taught core modules emphasis will be given to work-based coursework)
- Interim critiques of journal papers and dissertation on current issues pertinent to cellular and molecular pharmacology

### **Thinking skills are assessed by**

- Examinations and coursework (in the taught core modules emphasis will be given to work-based coursework)
- Final oral examination
- Tutorials with University and work-based supervisors

### **Practical skills are assessed by**

- Laboratory practical / coursework (in the taught core modules emphasis will be given to work-based coursework)
- Reports from work based supervisors

### **Skills for life and work (general skills) are assessed by**

- Laboratory practical/ coursework (in the taught core modules emphasis will be given to work-based coursework)
- Coursework reports
- Reports from work based supervisors

## **Quality**

### **How we assure the quality of this programme**

#### **Before this programme started**

Before the programme started, we checked that:

- there would be enough qualified staff to teach the programme;
- adequate resources would be in place;
- the overall aims and objectives were appropriate;
- the content of the programme met national benchmark requirements;
- the programme met any professional/statutory body requirements;

- the proposal met other internal quality criteria covering a range of issues such as admissions policy, teaching, learning and assessment strategy and student support mechanisms.

This is done through a process of programme approval which involves consulting academic experts including some subject specialists from other institutions.

### **How we monitor the quality of this programme**

The quality of this programme is monitored each year through evaluating:

- external examiner reports (considering quality and standards);
- statistical information (considering issues such as the pass rate);
- student feedback.

Drawing on this and other information, programme teams undertake the annual Review and Enhancement Process which is co-ordinated at School level and includes student participation. The process is monitored by the Quality and Standards Committee.

Once every six years an in-depth review of the whole field is undertaken by a panel that includes at least two external subject specialists. The panel considers documents, looks at student work, speaks to current and former students and speaks to staff before drawing its conclusions. The result is a report highlighting good practice and identifying areas where action is needed.

### **The role of the programme committee**

This programme has a programme committee comprising all relevant teaching staff, student representatives and others who make a contribution towards the effective operation of the programme (e.g. library/technician staff). The committee has responsibilities for the quality of the programme. It provides input into the operation of the Review and Enhancement Process and proposes changes to improve quality. The programme committee plays a critical role in the quality assurance procedures.

### **The role of external examiners**

The standard of this programme is monitored by at least one external examiner. External examiners have two primary responsibilities:

- To ensure the standard of the programme;
- To ensure that justice is done to individual students.

External examiners fulfil these responsibilities in a variety of ways including:

- Approving exam papers/assignments;
- Attending assessment boards;
- Reviewing samples of student work and moderating marks;
- Ensuring that regulations are followed;
- Providing feedback through an annual report that enables us to make improvements for the future.

## **Listening to the views of students**

The following methods for gaining student feedback are used on this programme:

- Module evaluation questionnaires
- Student representation on the programme committee (meeting 2 times a year)
- Informal discussions with tutors

Students are notified of the action taken through:

- Circulating the minutes of the programme committee meetings to all members
- Providing details on the programme notice-board
- Oral feedback to students

## **Listening to the views of others**

The following methods are used for gaining the views of other interested parties:

- Feedback from previous students
- Discussions with employers

## **Further Information**

### **Alternative locations for studying this programme**

<b>Location</b>	<b>Which elements?</b>	<b>Taught by UEL staff</b>	<b>Taught by local staff</b>	<b>Method of Delivery</b>
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### **Where you can find further information**

Further information about this programme is available from:

- [The UEL web site](#)
- The student handbook (available on request)
- Module study guides
- [UEL Manual of Regulations and Policies](#)
- [UEL Quality Manual](#)
- [School web pages](#)