

Institute of Cancer
MSc Cancer Therapeutics



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Institute of Cancer



The creation of the Cancer Institute, as part of the School's restructuring in 2003, was a key step in the establishment of a major international centre of excellence in both cancer research and clinical cancer care on the West Smithfield site at St Bartholomew's Hospital and in Charterhouse Square. The Institute currently consists of six research 'Centres'.

- **Centre for Cancer and Inflammation**
Professor Fran Balkwill
- **Centre for Cell Signalling**
Professor Bart Vanhaesebroeck
- **Centre for Experimental Cancer Medicine**
Professor John Gribben
Professor Nick Lemoine
- **Centre for Medical Oncology**
Professor Andrew Lister
- **Centre for Molecular Oncology and Imaging**
Professor Nick Lemoine
Professor Steve Mather (Deputy)
- **Centre for Tumour Biology**
Professor Ian Hart

The Institute's Teaching Centre was opened in September 2006 offering three well-subscribed MSc programmes.

The Centre is dedicated to the Institute's MSc students and includes a fully equipped laboratory, lecture room and a computer lab.



Programme information

Academic rationale

Cancer is the cause of over 25 per cent of all deaths in the UK. Despite major advances in treatment over the last 25 years, over half of the 270,000 new cancer cases registered in the UK each year will go on to die of their disease. New treatment options are clearly required, a process that will require staff at all levels of the development process to be appropriately trained and skilled in cancer therapeutics and new treatment development.

This programme is designed to give students a detailed and thorough understanding of cancer therapeutics, based on knowledge of cancer biology, pathology, and research methodology. This will provide you with a good grounding in the use and evaluation of cancer therapies, which will enhance your career prospects in many areas of early phase clinical trials and clinical drug development in the cancer setting.

It will also provide proven theoretical and practical skills suitable for entry to a PhD degree programme.

There are few similar MSc programmes available within the UK. As outlined above, we are able to offer such a programme because of the grouping of cancer expertise that now exists within the Institute and the CRUK Clinical Centre at Queen Mary and St Bartholomew's Hospital.

Educational aims

The specific aims of the programme are to provide participants with a clear understanding of the scientific basis underlying the principles

and practice of cancer therapeutics and the development, evaluation and implementation of new treatments. This is underpinned by a thorough knowledge of cancer biology and pathology, research methodologies, drug development, and regulatory issues.

Learning objectives

On completion of the programme, you will:

- Have a thorough knowledge of the principles underlying cancer treatment
- Be able to demonstrate skills in gathering, recording, analysing, and presenting information
- Understand the regulatory framework underlying clinical research
- Understand the principles of laboratory methodologies applied to clinical trials
- Understand the steps involved in developing and implementing new treatments
- Be able to apply this knowledge in your own professional roles
- Be able to contribute to the research activity and knowledge base in improving cancer care

Career prospects

On completion you will have the theoretical and practical background to go into further laboratory or clinical research, or into various aspects of cancer drug development and clinical evaluation in the context of early phase trials.

Programme structure

Programme outline

Awarding body/institution:

Queen Mary, University of London

Teaching institution:

Barts and The London School of Medicine and Dentistry, Queen Mary, University of London

Name of final award:

Postgraduate Certificate (PGCert)

Postgraduate Diploma (PGDip)

Master of Science (MSc)

Programme Director:

Dr Simon Joel

Core modules

Research Methods and Science Skills

(2.0 unit module)

Dr John Marshall and Dr David Prowse

The module contains both taught and practical elements in which you will:

- Learn the principles and applications of a range of laboratory techniques and data analysis
- Be made aware of the ethical framework in which research is undertaken
- Gain experience in handling tissue samples
- Learn about and use a range of statistical methods.

Cancer Biology (1.0 unit module)

Professor Ian Hart

This module covers cell and molecular biology relevant to cancer, including:

- The processes of carcinogenesis and DNA damage
- The key cellular and molecular processes affected in tumour development
- Key proteins and pathways regulating cell proliferation and cell death
- A broader concept of malignancy and its environment
- Processes involved in invasion and metastasis.

Cancer Pharmacology (1.0 unit module)

Dr Simon Joel

This module will provide teaching in pharmacology relevant to the treatment of malignant disease, including:

- The basic concepts of cancer chemotherapy
- Practical and theoretical aspects of pharmacokinetics and pharmacodynamics
- The basic clinical and molecular pharmacology of the major classes of anti-cancer agents
- Novel cancer therapies using small molecules.

Biological Therapies (1.0 unit module)

Professor Fran Balkwill and Professor Iain McNeish

This module will provide an understanding of the science behind the biological therapies of cancer, and an up-to-date review of the current status of preclinical and clinical trials. The module will also provide an insight into the ways that laboratory research is translated into clinical trials.

By the end of the module you will be able to:

- Understand the basis of biological therapy of cancer
- Understand the role of non-malignant cells and mediators in cancer growth and progression

- Understand the mechanisms by which knowledge of cancer biology is translated into clinical trials.

Ablative Therapy (0.5 unit module)

Dr Amen Sibtain

This module will provide an understanding of the science and principles underlying the use of radiotherapy and surgery in the treatment of malignant disease.

Site Specific Tumour Treatment (0.5 unit module)

Dr Thomas Powles

This module will provide you with an understanding of the basic principles and management of the major types of cancer, including:

- Diagnosis and staging
- Treatment
- Prognosis
- Late effects of treatment.

Drug Development (0.5 unit module)

Dr Simon Joel and Professor Atholl Johnston

On completion of this module you will have detailed knowledge on the principles and practice of drug development at all stages of the development process, including:

- Ethical and good practice issues
- What a therapeutic target is
- How novel therapeutic targets are identified
- How therapeutic targets are validated
- Early clinical trials methodology.



Module options

Imaging (0.5 unit module)

Professor Rodney H Reznik

This module will provide an understanding of the science and principles underlying the use of a number of imaging techniques in the diagnosis and treatment of malignant disease. Aims are:

- To introduce the vital role imaging plays in all aspects of the management of patients with cancer
- To provide an overview of different imaging technologies and their application for this purpose
- To introduce the role of imaging in development of cancer treatments (drug, radiotherapy, surgical)
- To introduce the principles of the generation of images of all these technologies (ultrasound, computed tomography, magnetic resonance imaging, nuclear medicine)
- To understand the risks of imaging to the patient.

Programme structure (cont)

Pathology of Cancer (0.5 unit module)

Professor Louise Jones and Professor Ian Hart

This module will provide an understanding of cellular and clinical aspects of cancer pathology, focusing mainly on the histological features of neoplastic processes in common tumours. By the end of the module you will have a good understanding of:

- Normal tissue histology
- Tumour histology
- Effects of tumours on normal pathology.

Genomic Approaches to Human Disease (0.5 unit module)

Professor Bryan Young and Dr Tanja Crnogorac-Jurcevic

This module will provide detailed teaching on the principles and interpretation of large scale genomic and proteomic approaches to cancer, including:

- The application of genomic technology
- The working principles of expression array and genotype array technology
- The principles of bio-statistical analysis of genomic data
- The advantages and limitations of the various genomic approaches described
- The use of proteomic approaches in studying cancers.

Paediatric and Adolescent Oncology (0.5 unit module)

Dr Tony Ford and Dr Louise Jones

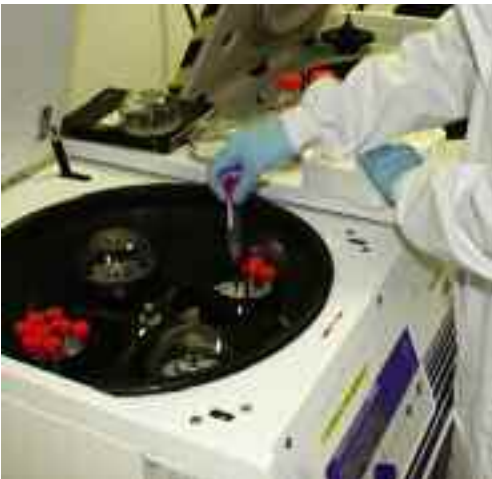
The module will provide an intense and comprehensive overview of Paediatric and Adolescent Oncology, from disease aetiology to novel treatments, and aims to equip the student with a fundamental understanding of the subject area. Topics covered include:

- The aetiology of paediatric leukaemia and selected paediatric solid tumours
- The molecular aspects of selected paediatric cancers, and how understanding the genetic basis of such cancers has improved molecular diagnostic techniques
- The principles of paediatric cancer therapy, from past to present, including novel targeted therapies
- The treatment of cancer in adolescent patients.

Cancer Prevention and Screening (0.5 unit module)

Professor Peter Sasieni and Professor Stephen Duffy

This module will provide an understanding of population-based studies and methodology used in cancer epidemiology, focusing on the value of these approaches in cancer prevention and





in the design and evaluation of screening programmes. Topics covered include:

- The major environmental causes of cancer and their contribution to cancer worldwide
- The potential for reducing cancer incidence
- The role of screening in cancer control
- The prospects for the chemoprevention of cancer in the next ten years.

Students must select three out of the five option modules. We require minimum of six students for an optional module to run for the academic year.

Laboratory Project (4.0 unit module)

The aim of this module is to give you the opportunity to complete a substantial research project within an Institute research laboratory. An appropriate project will be assigned to each student according to their interests. This module will give you the experience of working as part of a research group. On completion of the project, you will be able to:

- Carry out background research into a project
- Design and implement their own experiments
- Interpret data and analyse their own results
- Prepare a scientific project report
- Prepare and give an oral presentation describing project findings.

Programme timetable

Semester one modules (September – December)

- Research Skills and Sciences
- Cancer Biology
- Cancer Pharmacology
- Pathology of Cancer*

Semester one examinations – January

Semester two modules (January – April)

- Site Specific Tumour Treatment
- Ablative Therapy
- Drug Development
- Biological Therapies
- Paediatric and Adolescent Oncology
- Imaging*
- Cancer Prevention and Screening*
- Genomic Approaches to Human Diseases*

Semester two examinations – April

* Option modules – Availability of option modules will be subject to minimum student numbers.

Semester three: Laboratory Project (April – July)

12 week lab project

Semester three presentations and viva – August

Winter graduation

December

Programme structure (cont)

Teaching, learning and assessment strategies



Mode of study

Full-time: Students will have two full days of teaching in semesters one and two, and 12 weeks in the lab for semester three.

Part-time: Students will have one full day of teaching per semester for two academic years and can select which year to do the lab project (providing academic requirements are met).

Distance learning option: This programme is now also available as a distance learning option, based on WebCT. Students are able to follow each lecture online via lecture recording and slide/whiteboard content. All assigned work is submitted via WebCT. Students are encouraged to interact with teaching staff and other students via online discussion forums and joint or group activities, and also attend a summer school.

Teaching strategy

Module and project teaching will comprise the following:

- Seminars/lectures on specific topics. Tutors and students are encouraged to develop a tutorial atmosphere in which dialogue and discussion can take place
- Practical classes in pairs or small groups to address a specific practical method or topic. A newly refurbished laboratory will be used for these teaching sessions
- Demonstrations – these will take place in Institute laboratories or the classroom to address specific technologies (expression array technology) or methods (array data analysis)
- Student presentations on specific topics.

Additional learning and support

- Individual tuition will take place for all students during the four-module project, or for students who require additional input in a particular topic area
- Key generic transferable skills will be acquired
- Teaching material will be available on the college internet site via WebCT
- Students will be assigned a mentor on entry to the programme. This mentor will advise on issues arising from the programme and advise on issues such as post programme employment and further training opportunities

- Students will have full access to the college/medical school library and student computing facilities, in addition to the computer room provided
- Students will be encouraged to attend the weekly seminar programmes in Medical Oncology and Molecular Oncology, as well as the CRUK Clinical Centre Distinguished Guest Speaker Programme (six lectures per year)
- Additional support classes for academic English language and IT packages will also be provided.

Assessment strategy

To be eligible for each award the student must satisfactorily complete:

- Postgraduate Certificate – four unit modules
- Postgraduate Diploma – eight unit modules
- Master of Science – twelve unit modules.

Assessment of individual modules will consist of multiple-choice questions, short answer examination papers, practical assessments, presentations, and marked coursework. There will be variation in the relative contribution of each assessment method between modules.

Graduate Profile: Firas Abed, 2008/09 Graduate with Distinction

The Cancer Therapeutics course offers a portal to the new world of cancer research. Through its diverse modules, the course covers cancer from different angles that may interest students from different backgrounds as it has a 'dish for every taste'. Despite the fact that it is mainly into research, prior lab experience is not an issue to progress through the course. I did Medicine for my Bachelor Degree and I had near zero lab experience. This has not been a problem, however, owing to the Research Skills Module, which provides a starting point for those with no lab experience and consolidates lab skills for students that already have it.

The course not only introduced me to the available cancer medicines and novel therapies, but also gave me an insight into the steps required to develop new medications and take them to clinical trials in the real world.

A powerful thing about the Cancer Therapeutics course is that you get to learn from your mistakes! Marking of all course work is given with professional feedback that I found extremely helpful and allowed me, with time, to upgrade my skills in scientific writing and presentations, an important goal of the course.

Contacting the tutors and the staff was very easy and you can get an answer for every question you have in very short time.

Finally, I was lucky enough to practice what I have learned in the course as I joined the Cancer Pharmacology Group at the Institute of Cancer. I am using the same skills I acquired during the lab project to trial new cancer medicines.

Student experience (cont)

Graduate profile: Asmah Syed 2008/09 Graduate with Distinction

Prior to studying Cancer Therapeutics I had just completed my undergraduate study in Biomedical Sciences at Queen Mary, University of London.

I decided to pursue the Cancer Therapeutics course because I had been taught by many of the academic staff from the Institute of Cancer and I enjoyed the material as well as the different teaching styles.

I had always planned to study Medicine and I feel that the course has been an invaluable experience in allowing me to thrive in the demanding field of Medicine.

I thoroughly enjoyed all the taught modules throughout both semesters. The highlight of the course for me has to be the lab project, where you can apply the techniques you have been taught to investigate an aim. The lab project allows you to work with a lab group and actually experience life as a research scientist. Nothing can compare to the feeling of getting your first positive results from an experiment you did yourself!

I completed the course with a distinction and I am now studying Medicine. I feel that the Master's course has shaped my future because I now feel that Oncology may be the speciality for me.

I would highly recommend the MSc Cancer Therapeutics course to anyone interested in Oncology and cancer research. I thoroughly enjoyed my time on this course and I have gained much valued knowledge.

Further information

Fees

For more information about fees and methods of payment, please visit: www.qmul.ac.uk/tuitionfees
The fees for the Programme are:

Home students (UK and EU)		
	Full-time (one year)	Part-time (two years)
Programme fees	£4100	£2200 per annum
Bench fees	£1650	£850 per annum

Overseas students (non-EU countries)		
	Full-time (one year)	Part-time (two years)
Programme fees	£13970	£7300 per annum
Bench fees	£1680	£850 per annum

Distance Learning programme fees

UK and EU

Postgraduate Certificate	£2600*
Postgraduate Diploma	£5000**
MSc	£6750

Non-EU

Postgraduate Certificate	£5400*
Postgraduate Diploma	£10500**
MSc	£13500

* Includes the taught part of year 1 Summer School

** Includes the taught part of year 2 Summer School

(Fees are an approximation based on the 2009/2010 rates and are subject to adjustment for the 2010/11 academic year)

Admission criteria

The programme is open to graduate scientists, nurses, clinicians, and other professionals allied to medicine, working in healthcare, the pharmaceutical industry, or contract research organisations. We aim to enrol 20 students each year.

For admission to the programme you will need either:

- A good degree or degree equivalent from a recognised academic institution

or

- An appropriate, equivalent, professional qualification or experience acceptable to the Programme Director and Institute Postgraduate Tutor

Students for whom English is a second language will also require a minimum score of IELTS 7 or TOEFL 610.

Other factors contributing to selection for entry to the programme will be:

- Previous educational qualifications
- Work and research experience
- The reasons for taking the programme
- Future career and/or research plans
- Letters of recommendation.

Enquiries

General enquiries

email: cancercourses@qmul.ac.uk

Programme Director

Dr Simon Joel

Cancer Pharmacology Group

Centre for Experimental Cancer Medicine

Medical Oncology Laboratory

3rd Floor, John Vane Science Centre

Barts and The London School

of Medicine and Dentistry

Charterhouse Square

London EC1M 6BQ

Tel: +44 (0)20 7882 3821

email: S.P.Joel@qmul.ac.uk

How to apply

You can make an online application form or submit a hard copy to our Admission and Recruitment Office at Mile End. You will need the following documents to hand when submitting your application form:

- Copy of your certificate or transcript
- Personal statement stating why you are interested in the course
- Two academic/employment reference
- IELTS or TOFEL certificate if you are an overseas student

For further information, visit our website below or contact the Teaching Office on 0207 882 2081 or cancercourse@qmul.ac.uk

www.cancer.qmul.ac.uk/teaching_centre/courses/postgrad.html

Barts and The London School of Medicine and Dentistry

Barts and The London School of Medicine and Dentistry is a major centre of medical and dental teaching and research in London. It was formed in 1995 following the merger of the Medical College of St Bartholomew's Hospital and the London Hospital Medical College, both important training institutions with long and distinguished histories. This united the strengths of these institutions and the skills of the staff who are involved in clinical care and internationally acclaimed research.

Other useful contact details

General postgraduate information

Tel: +44 (0)20 7882 7952/7840
email: askthegradteam@qmul.ac.uk

School of Medicine and Dentistry The Admissions and Recruitment Office

Room CB02
Queens' Building
Mile End
London
E1 4NS
Tel: +44 (0)20 7882 5533
email: pgsmd@qmul.ac.uk

Fees Office (in Finance Office)

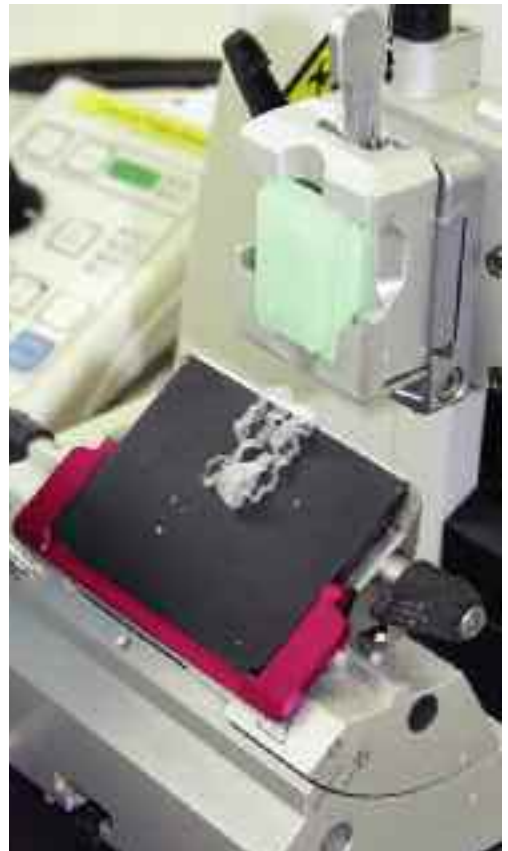
Queens' Building
First floor
Tel: +44 (0)20 7882 7676

International office

Queens' Building
Room E104
Tel: +44 (0)20 7882 3066
email: International-office@qmul.ac.uk

CCRS Residences Office (accommodation)

Tel: +44 (0)20 7882 5522





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