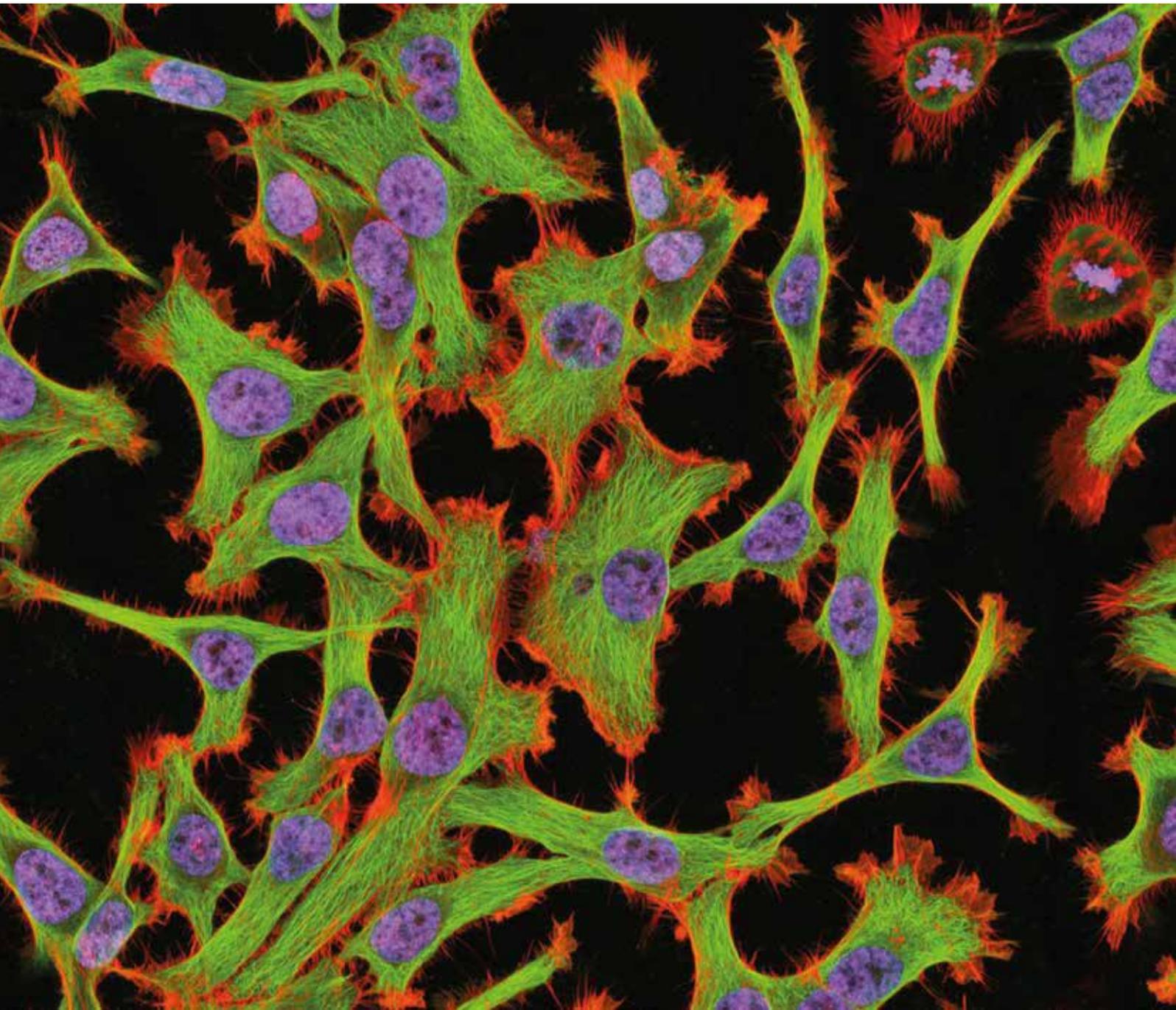
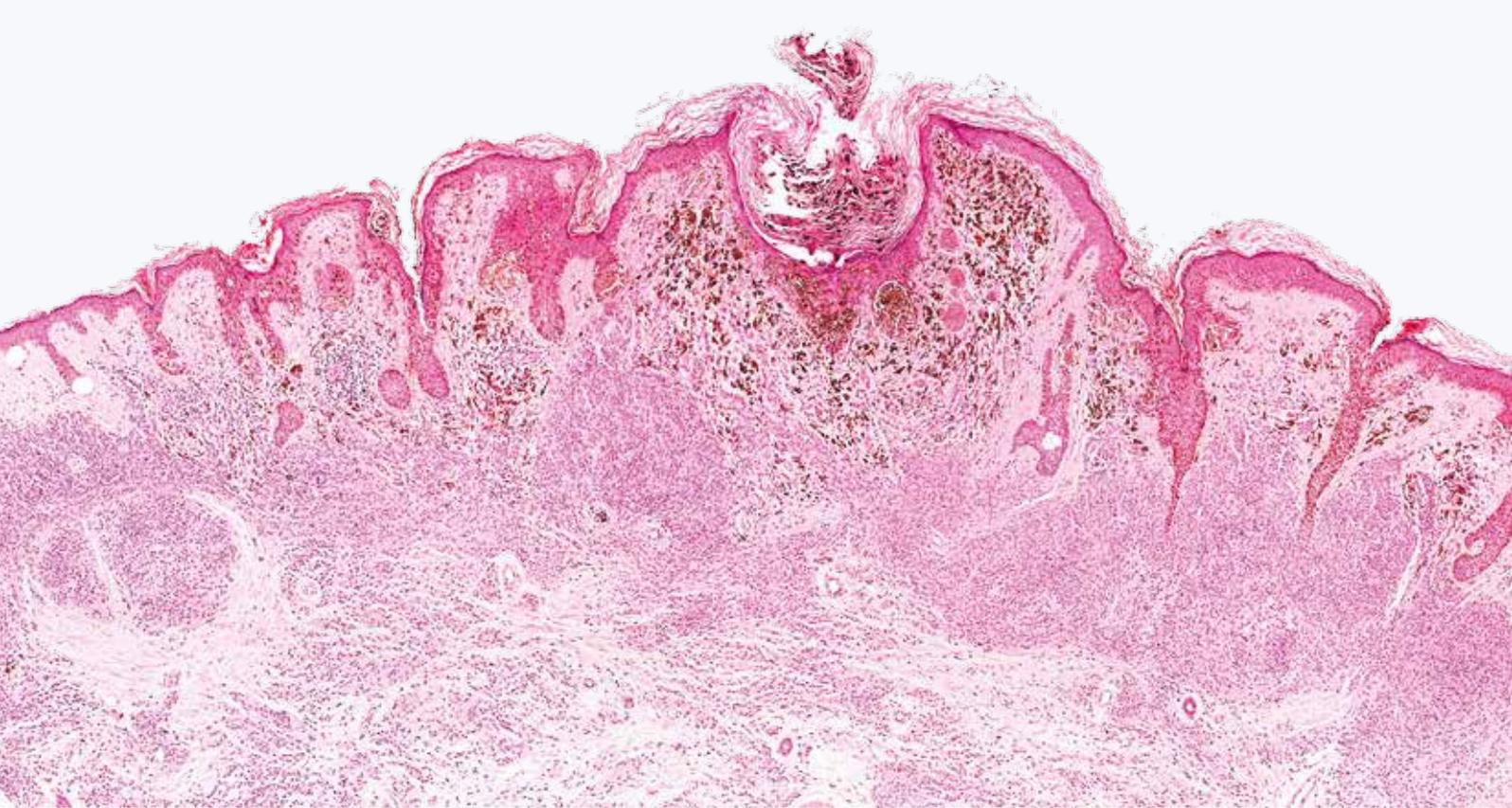


MSc course in

Molecular Pathology and Therapeutics of Cancer





MSc Molecular Pathology and Therapeutics of Cancer

Why study Molecular Pathology and Therapeutics of Cancer with us?

This exciting new course is designed to equip future scientists and clinicians with the fundamental knowledge to make a difference in the understanding and treatment of cancer. Run and delivered by the same team that trained more than 300 graduates over 20 years on its predecessor MSc course in Molecular Pathology and Toxicology, this new MSc course will enable you to gain a mechanistic understanding of cancer biology and use it to analyse risk, prevention, diagnosis, prognosis and therapy of cancer. Building on a foundation in cancer cell biology, the translational element of the course will consider the design of treatment modalities, including radiotherapy, mechanisms of action of anti-cancer drugs, therapy resistance, biomarker discovery and use, cancer chemoprevention, anti-cancer target discovery and validation, clinical trials, imaging, cancer epidemiology and biostatistics. A key component of the course will be a six month research project, which will give you an opportunity to study one of these areas in more depth. The research experience gained during the six month laboratory research project is particularly valued by employers in industry and by potential PhD supervisors.

Course Aims

The MSc in Molecular Pathology and Therapeutics of Cancer aims to train students in advanced molecular and cellular biology skills that can be applied to research into cancer diagnosis and therapy considered useful at higher education facilities and by industry. This is achieved by advanced level instruction and education into the theoretical aspects of molecular pathology and cell biology within the context of cancer, as well as providing you with the laboratory and analytical skills that can then be put into practice in the research project phase of the course and which is particularly valued by future employers.

Modules

Molecular Pathology and Cell Biology of Cancer

Lectures and tutorials in this module introduce you to the basics of cancer cell biology and the principles of molecular pathology as applied to cancer and covers the key molecular changes happening during the transformation of normal cells to malignant cells, the process of tumour initiation and progression, de-regulation of signalling in malignancy and the ways in which apoptosis, angiogenesis and metastasis, genotoxicity and oxidative stress contribute to tumour development. These concepts are supported by four, week long laboratory sessions covering DNA damage, gene expression analysis of tumour samples, metastatic mechanisms and mechanisms of tumour cell sensitivity to chemotherapeutic agents. These practical sessions provide hands-on experience in gel electrophoresis, western blotting and the principles of human cell culture, confocal microscopy, fluorescence microscopy/ image analysis and immunocytochemistry/ immunofluorescence techniques. Lectures and tutorials embedded within the practical sessions provide background context to the laboratory work as well as guidance in data interpretation and scientific report writing.

Molecular Methods and Experimental Design

In this module, tutorials, lectures and laboratory classes will provide you with the core competencies required of research scientists in the biosciences. You will be taught how to design experiments and the theoretical and practical components of common molecular biology techniques. The laboratory skills covered include: cellular and molecular methods to investigate cellular function, genetic variation and gene expression. In addition to the laboratory programme, you are also trained in biostatistics, the skills required for effective oral and poster presentations, utilising on-line genetic sequence databases and management of the scientific literature.

Cancer Therapeutics

Building on teaching delivered in the first semester this module places the molecular and cell biology of cancer into a translational context. Delivered by both academic and

clinical staff, the module covers inter-related, yet diverse areas including, biomarkers of cancer and their use in diagnosis and monitoring, cancer chemoprevention, strategies and mechanisms of chemotherapy and radiotherapy, immunotherapy and biological therapy of cancer, surgery and cancer treatment, anti-cancer drug target discovery and the design and validation and clinical trials. The module tests the learning objectives through a short individual literature-based project enabling one of these areas to be examined in greater depth.

Laboratory Research Project

One of the most valued features of this MSc course is the laboratory research project, in which you put your newly acquired practical skills and knowledge to the test. For six months, you work as a member of a dedicated research team, designing and conducting your own experiments culminating in the production of a dissertation. Recent titles offered on the predecessor MSc. Molecular Pathology & Toxicology course and relevant to this MSc. include:

- Biomarkers of bladder cancer in human urine
- Use of human adult stem cell models for assessing the efficacy of cancer chemopreventive and chemotherapeutic agents
- Translating prognostic biomarkers in melanoma
- Monitoring the circulating cancer genome for patient follow up
- Lung cancer detection in sputum
- Development and application of PCR assays for detection of cancer driver mutations

Some of the data generated from these previous projects have been published:

Britton RG, Horner-Glister E, **Pomenya OA**, Smith EC, Denton R, Jenkins PR, Steward WP, Brown K, Gescher A, Sale S (2012). Synthesis and biological evaluation of novel flavonols as potential anti-prostate cancer agents. *Eur. J. Med. Chem.* 54: 952-958

Al-Salmani K, **Abbas HHK**, Schulpen S, Karbaschi M, **Abdalla I**, Bowman KJ, So KK, Evans MD, Jones GDD, Godschalk RW, Cooke MS (2011). Simplified method for the collection, storage, and comet assay analysis of DNA damage in whole blood. *Free Radical Biol. Med.* 51: 719-725.

Sayan AE, Griffiths TR, Pal R, Browne, GJ, Ruddick A, Yagci T, Edwards R, Mayer NJ, Qazi H, Goyal S, **Fernandez S**, Straatman K, Jones GD, Bowman KJ, Colquhoun A, Mellon JK, Kriajevska M, Tulchinsky E. (2009). SIP1 protein protects cells from DNA damage-induced apoptosis and has independent prognostic value in bladder cancer. *Proc Natl Acad Sci U S A* 106: 14884-14889

Student Profile



Dipti, MSc student

I chose to do a Masters because I wanted to carry on learning about biology and expand on my lab skills. I chose to do it at Leicester because of the interesting course content and the six-month lab project opportunity, which has allowed me to work in a lab and undertake my own research.

The teaching comprises seminars, lectures and practical elements. The teaching is excellent and varied, meaning there is always something new to learn. The six-month lab project allowed me to improve my practical skills and analytical skills and develop independence within a lab environment. I definitely feel I have been well supported by the Department and the most enjoyable part of the MSc has been the taught lab sessions at the beginning of the course.

The University offers excellent support from the teaching staff and departments. The lovely campus is compact and friendly with everything you need within walking distance. There are good facilities and a good library.

Postgraduate student life

The iconic Percy Gee Students' Union building provides a warm, welcoming and friendly environment for all students. There is everything a busy student needs, whether that's getting an early morning pick-me-up at Starbucks, grabbing lunch at 1923, or stocking up on study essentials at Ryman.

At the heart of the Students' Union is the Square – a huge atrium and terrace area – it's the perfect place for relaxing and catching up with friends.

Throughout the year, all manner of social and academic-related events are arranged through the SU – fundraising activities, health awareness campaigns, fashion shows, charity events and, of course, a superb nightlife.

As a postgraduate you are encouraged make your voice heard. Annual elections vote in members of the Students' Union Executive, who oversee its strategic and political direction.

Being a part of a society is a sure way of getting involved in the University community.

Societies offer a chance to meet like-minded people, have fun and try something new. Whatever you're into there will be a society for you – there are over 200 at Leicester. The Students' Union is home to groups in sport, media, politics, performing arts, music, volunteering, fundraising, plus the specialist and zany.

For more information please visit: www.leicesterunion.com



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Your city

Leicester is a lively and diverse city and the tenth largest in Britain. It has all the activities and facilities you would expect, with a friendly and safe atmosphere. The city centre is just a short walk from campus so you'll never be far from the action.

Leicester's diverse heritage is reflected in a dazzling array of festivals and cultural experiences including the largest Diwali celebrations outside India, the UK's longest running Comedy Festival and the University's hugely successful book festival – Literary Leicester.

Recent developments have led to the opening of the world class Curve Theatre and Phoenix Square Independent Arts Centre in the new Cultural Quarter, which complement Leicester's existing array of cinemas, theatres, museums and galleries.

Leicester is a city of sporting excellence. Sports fans can enjoy Premier League football with Leicester City and watch top-class rugby at Welford Road, home of the mighty Leicester Tigers. The Leicester Riders are a formidable presence in the British Basketball League (BBL), and during the summer months, Leicestershire County Cricket Club compete in the county championship and T20 Blast competition.

The sparkling Highcross complex features 110,000 square metres of retail therapy, bars, cafés and restaurants. For those with independent tastes Leicester Lanes houses a variety of boutiques and specialist shops.

As you would expect from a true student city, there is a huge range of bars, clubs and live music venues that cater for all kinds of tastes. Food lovers are treated to a fantastic selection of restaurants, with specialities available from every corner of the world.

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Sports fans can enjoy Premier League football with Leicester City and watch top-class rugby at Welford Road, home of the mighty Leicester Tigers.





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For more information

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**University of
Leicester**

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All information in this document was correct at the time of going to press. However, changes and developments are part of the life of the University, and alterations may occur to the programmes and services described in this brochure.