College of Science

School of Pharmacy

Discover your future…
It is my great pleasure to introduce you to the School of Pharmacy and share some of our exciting developments. The aim of our brand new School of Pharmacy is to produce passionate pharmaceutical science and pharmacy graduates who will be equipped to address the major healthcare challenges of the future. These include an aging population with long-term medical conditions, the development of personalised medicine, the need to optimise the effectiveness and safety of existing medicines, and the discovery and development of new medicines through better prescribing, research, drug development and education.

Pharmacists and pharmaceutical scientists both have a unique potential to forge strong bridges between the science and healthcare communities improving the lives of patients— I hope you will join us in building these bridges.

Dr Paul Grassby
Head of School

The new School of Pharmacy will create a much needed pool of pharmacists in the heart of Lincolnshire, providing a major boost in terms of patient care, teaching and research.”

Alistair Farquhar
Head of Pharmacy, Lincolnshire Co-operative
The School currently offers two undergraduate programmes – the BSc (Hons) Pharmaceutical Sciences and the MPharm Pharmacy. Students will be taught by academics who are at the forefront of their fields, together with practising pharmacists and pharmaceutical scientists.

**BSc (Hons) Pharmaceutical Sciences**

The Pharmaceutical Science degree has been designed for scientists who wish to work in the pharmaceutical and biotechnology industries, both in the UK and abroad. Studying for a BSc in Pharmaceutical Science at Lincoln will introduce you to the exciting world of drug discovery, development and vigilance; from the fundamental science behind how pharmaceuticals are identified, through to their mechanism of action, delivery and clinical trials. The course provides comprehensive training in a wide variety of the pharmaceutical disciplines required to understand the structure, function, synthesis, mechanisms of action and formulation of new drugs. Key disciplines include chemistry, biochemistry, pharmacology, physiology and toxicology.

**Key Features:** Graduates are ready to enter the pharmaceutical and associated industries in the UK and across the globe due to the unique curriculum, which has been developed in the close co-operation of the pharmaceutical industry.

**MPPharm Pharmacy***

The MPharm Pharmacy has been designed to fully integrate the science of medicines with clinical patient-facing and professional skills, in the context of current and future pharmacy practice. You will explore how drugs are discovered and produced, how they interact with the body to treat or prevent disease, how the body interacts with medicines and how medicines are evaluated. Alongside this, you will develop the clinical decision making and communication skills required to translate and apply the science of pharmacy to optimise treatment for individual patients within the different sectors of pharmacy practice.

**Teaching with Impact**

Patient-facing skills such as communication skills, clinical decision making, responding to symptoms in the pharmacy, patient counselling and history taking, and care planning, are taught using role play and videos. This is supported by work placements and in-house patient interviews. Students will care for a number of “virtual patients”, through various life stages as the course progresses. We have a commitment to research-informed and research-engaged teaching, where students will be encouraged at all times to work alongside staff in the design and delivery of their teaching and learning programmes.

**Work-based Placements**

Students on the Pharmaceutical Science course will participate in visits to pharmaceutical companies and have the opportunity to hear from visiting lecturers from the industry. MPharm Pharmacy students will have a practicing pharmacist mentor for the duration of their studies and the opportunity to undertake placements within hospital, community, primary care and industrial pharmacy settings.

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*Subject to validation.*
Dr Driton Vllasaliu’s work aims to discover alternative ways of delivering drugs that are currently limited to injections – which are often painful and expensive. Biotherapeutics, such as peptides, proteins and nucleic acids, are a new class of medicines that offer tremendous therapeutic possibilities. However, their delivery to patients is currently largely limited to injections (e.g. insulin). Dr Vllasaliu aims to enable non-invasive delivery of biotherapeutics, focusing on oral administration or via the airways.

As biotherapeutics are complex and large molecular weight molecules, their absorption is severely restricted. Dr Vllasaliu is able to enhance the absorption of biotherapeutics in the lab by temporarily modifying the body’s internal barriers or through the use of nanoparticles as drug carriers – an approach that is central to “nanomedicine”.

In his drug absorption and nanomedicine-related research, Dr Vllasaliu uses cell culture models of the intestinal and airway epithelia. Another aspect of his work involves exploring ways to improve these models, which can be used to study drug delivery systems and reliably predict drug absorption.

Dr Graham Lappin’s work has revolutionised our ability to monitor cells in the human body using radiocarbon. The use of radiocarbon in studies with humans is severely restricted due to the radioactive burden. The radioactive isotope of carbon, radiocarbon – commonly referred to as 14C – is best known for its association with radiocarbon dating of archaeological artifacts, where it is used to estimate the age of organic materials. 14C is also useful in biomedical research, where it is used to trace molecules of interest through a plethora of organic substances present in living cells. It is however, difficult to use 14C in studies with humans because of the radioactive exposure.

Dr Graham Lappin has combined an extremely sensitive analytical technology called accelerator mass spectrometry (AMS), which was first used for archaeological radiocarbon dating. AMS is so sensitive that it can measure the equivalent of one bottle of wine stirred into all the oceans of the planet Earth! The use of AMS enables extremely small amounts of 14C to be used in human studies, reducing the radioactive burden to virtually background.

Dr Paul Grassby is working to improve pharmaceutical care and medicines optimisation. Dr Grassby is working with the National NHS Genetics Education Centre and local partners, investigating the potential clinical use of a patient genetic profile in improving prescribing, developing the role of the pharmacist in improving patient safety and outcomes, and developing innovative tools for use in pharmaceutical education.

University of Lincoln is a research-led organisation and is pioneering new developments that are shaping the world around us, bringing sustainable benefits for people and society.
Tour our Facilities

Crystal Engineering and Medicine Formulation

Professor Nicholas Blagden

The development of a medicine from an active pharmaceutical ingredient reaches an important stage when moving from a simple molecule to crystalline particles. These crystalline particles can then be processed into a material which can be used to produce tablets and capsules.

In many cases, molecules are designed for a therapeutic effect, but the properties of crystalline material are not considered, which may influence its pharmacokinetic (what the body does to the drug) and pharmacodynamics (what the drug does to the body) properties.

Professor Nicholas Blagden is developing an alternative approach to drug discovery and development, which advocates reintegrating the disciplines of crystallography with crystal growth into the drug discovery process.

Fast RNA Conjugations

Dr Ishwar Singh

Dr Ishwar Singh’s research aims to improve the diagnosis of DNA-related disorders. Working on the interface of chemistry, biology, medicine, nanotechnology and engineering, his current research comprises the design and targeted synthesis of molecules (e.g. peptides, peptoids, protein mimetics nucleosides, nucleotides and nucleic acids) and exploring their potential applications to target and modify DNA, RNA and proteins. This work will enable better tools for the diagnosis of DNA-related disorders.

Currently only 15% of the human proteins are druggable by small molecule drugs, leaving 85% of human proteins undruggable.

Peptides, proteins and nucleic acids, known as “Biologics”, provide a viable strategy to target 85% of undruggable human proteins, but their applications are currently limited due to poor cellular penetration. Dr Singh’s research is developing novel delivery vehicles for targeted biologics delivery, which could potentially be used without toxic effects.

The new School of Pharmacy will be housed, from Summer 2014, in a striking 1930’s art deco styled building, displaying features typical of that period. A total of £20 million is being invested by the University, in partnership with the Lincolnshire Co-operative, to create state-of-the-art laboratories and clinical teaching spaces, which will be known as the Joseph Banks Laboratories.

The Maltby Suite, a specialised teaching and learning suite for pharmacy, will include a mock pharmacy and drug store, a medicines suite and consultation rooms.

The Joseph Banks Building will form the hub of a new science and innovation park.

Some of the specialist equipment available to students will include:
- High-performance Liquid Chromatography
- Gas Chromatography
- Mass Spectrometry
- Imaging Suite
- Real-time Polymerase chain reaction
- Atomic Absorption Spectroscopy.
Futures in Pharmaceutical Science and Pharmacy

University of Lincoln graduates go on to have successful careers in private and public organisations, as well as starting their own businesses. Lincoln has an excellent track record for graduate employment, with more than 91% of graduates in employment or further study within six months of graduating.

You will have access to careers information and guidance through the Careers and Employability Team, including advice and support on developing a CV, applying for jobs and obtaining paid and voluntary work experience while you study.

For graduates, the University’s award-winning business incubator, Sparkhouse, is on hand to help those who have ideas for new enterprises and wish to set up their own businesses.

Tailored Services

A number of specialist services for Pharmacy students are available to ensure that you have access to relevant information about the many opportunities available to you upon graduation.

The School has a dedicated Careers and Employability Advisor who will run a drop-in clinic, providing personal guidance appointments. A programme of group workshops and presentations for specific courses run throughout the year, often involving national and international companies.

For more information on the full range of services available through the Careers and Employability Team at Lincoln, please visit www.uolcareers.co.uk

Career Opportunities

For BSc (Hons) Pharmaceutical Science graduates

Graduates are well placed to follow a diverse range of career pathways within industry and academia. Typical career opportunities include industrial research and development roles within the pharmaceutical, biotechnology and food industries, as well as in research laboratories in universities, hospitals and medical institutions. Opportunities also exist in scientific sales and marketing, scientific journalism and teaching.

For MPharm Pharmacy graduates

Career prospects for pharmacists are excellent in terms of their unique and diverse professional roles in taking responsibility for optimising the discovery, development, assessment, and safe and effective use of medicines in society.

Pharmacists are to be found within the pharmaceutical industry and regulatory bodies, undertaking a variety of roles such as research and development, or regulatory and drug safety roles. Increasingly pharmacists are to be found working in primary care settings, often as prescribing pharmacists with general practitioners. Within community pharmacy practice, the role of the pharmacist is continually expanding to include medication reviews, early diagnosis and public health initiatives, particularly in healthy living pharmacies.

Within hospital pharmacy many pharmacists work as full-time clinical pharmacists, providing direct care to patients and may achieve a consultant status.

In addition, the transferable skills such as communication, problem-solving and decision-making are valuable in many other spheres of employment.

You may wish to further your studies to MSc, MPhil or PhD level, and if you decide to do so, we hope to see you back at Lincoln.

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