It is my great pleasure to introduce you to the School of Pharmacy.

Our aim is to produce passionate and confident graduates who are well equipped for exciting and rewarding careers in drug development and healthcare.

Pharmacy and Pharmaceutical Science graduates can help address the major healthcare challenges of the future. These will include the development and use of personalised medicines; caring for an aging population with long-term medical conditions; and optimising the effectiveness and safety of medicines to keep our population healthy and to prevent hospital admissions.

By closely collaborating with local hospitals, community pharmacists, the pharmaceutical industry and general practice, our curriculum placement opportunities and interprofessional education are designed to help develop the skills to meet these needs, through the discovery and development of new medicines and by providing pharmaceutical care to patients.

I look forward to meeting you at an Open Day and welcoming you to the School of Pharmacy.

Dr Paul Grassby
Head of School
The School of Pharmacy aims to produce pharmacists and pharmaceutical scientists who are equipped to address future healthcare challenges and optimise the effectiveness and safety of medicines through research and education.

The School offers two undergraduate programmes – MPharm Pharmacy and BSc (Hons) Pharmaceutical Science. Students have the opportunity to learn from academics who are at the forefront of their fields, together with practising pharmacists and pharmaceutical scientists.

MPharm Pharmacy

The MPharm Pharmacy at Lincoln integrates the science of medicines and disease with the development of patient-facing, decision-making skills and practice required by modern pharmacists to care for patients. This four-year degree aims to provide students with the clinician-oriented expertise that is required in our profession.

The Lincoln MPharm qualification enables graduates, once they have completed an additional pre-registration year and passed a final national registration assessment, to apply for registration as a pharmacist with the General Pharmaceutical Council. The degree course at Lincoln has been designed to meet these educational standards and to produce the next generation of pharmacists. In common with all new qualifications, the Lincoln School of Pharmacy has provisional accreditation from the General Pharmaceutical Council and is working towards full accreditation.

Course structure

In the first year, childhood diseases are studied; in the second year, young adulthood; in the third year, middle age and in the fourth year, old age. The final year includes a project, elective modules and one or more placements.

Practical experiences

Patient-facing skills such as communication, clinical decision-making, patient counselling and history-taking, and care planning, are taught using role-play, medical actors and videos. This is supported by clinical placements, in-house patient interviews and knowledgeable staff, some of whom are practising clinical pharmacists.

The School of Pharmacy has a commitment to research-informed and research-engaged teaching. Students are encouraged to work alongside staff in the design and delivery of their learning and on research projects.

We use a variety of teaching methods on our undergraduate programmes including

- Integrated learning sessions
- Tutorials and seminars
- Practical classes
- Problem-based learning
- Computer-based learning
- Interprofessional learning.

Collaborative working

The University of Lincoln has developed a wide-ranging interprofessional education strategy to foster high standards of care through collaborative working in health and social care practice. The strategy enables meaningful engagement between students and staff in health, social care and related disciplines to meet the needs of service users, families and communities.

Professional accreditation

The General Pharmaceutical Council (GPhC) is the regulator for pharmacy in Great Britain and is the accrediting body for pharmacy education. The GPhC sets standards for the initial education and training of pharmacists, called ‘Future Pharmacists’. The MPharm degree course at Lincoln has been designed to meet these educational standards and to produce the next generation of pharmacists. In common with all new schools of pharmacy, the Lincoln School of Pharmacy has provisional accreditation from the General Pharmaceutical Council and is working towards full accreditation.

For more detailed information about this course, please visit

www.lincoln.ac.uk/u/phar

Undergraduate Study

Study a patient’s life cycle

Two fully integrated pharmacy modules are taught each year, making a total of eight modules. These follow the life cycle of the patient from a healthy state through the diseases and illnesses common to that stage of life. The science is revisited each year within the context of the different diseases common to each increasingly complex age group.

“I am fortunate to be part of the first cohort of MPharm students to study at Lincoln and being part of it has been challenging, yet exciting. The lecturers are helpful and supportive and are always open to new ideas and helping students voice their opinions.

“In the first year, I learned about medical conditions that generally affect babies and toddlers with a key focus on the use of antihistamines. The course progresses to focus on adolescents and adults. The final year delivers knowledge and its application in relation to care of the older person, covering conditions such as dementia.

“I’ve found that learning about medical conditions and their treatment while using the life cycle as a teaching framework makes it easier to relate the learning to real-life situations.”

Tarnjit Singh
MPharm Pharmacy student and President of the Pharmacy Society

We’re looking forward to establishing projects that will see Lincolnshire Co-op supporting the students, such as offering placements in our pharmacies so they can see how the academic skills they’re learning will relate to the job in practice.

Alistair Farquhar
Head of Pharmacy, Lincolnshire Co-op
BSc (Hons) Pharmaceutical Science

Pharmaceutical Science encompasses a range of scientific disciplines which introduce students to the exciting world of drug discovery, development and management. This three-year degree offers a fascinating insight into the structure, function and mechanisms of drugs; how different drugs can act on the human body and how their potentially life-saving effects can be safely harnessed.

There are opportunities for students to take part in research alongside academics to develop their knowledge and experience and enhance their skill set.

The first year introduces core subjects such as chemistry, biochemistry and metabolism, human anatomy and disease. During the second year, students progress to examine the analytical methods relevant to drug development, medicine delivery, immunology, pharmacology and toxicology, in addition to learning key research techniques. The third year introduces advanced subjects, as well as the regulatory and ethical standards that apply to industry professionals.

Current modules include
- Introduction to Pharmaceutical Science
- Drug Design and Development
- Drug Formulation and Delivery
- Pharmaceutical Materials Science
- Regulation, Quality and Ethics for the Pharmaceutical Scientist
- Immunology
- Toxicology
- Research Project.

There are opportunities to visit pharmaceutical companies and to learn from industrial scientists and leading experts through a programme of guest lectures.

The aim is to prepare graduates for roles in the pharmaceutical and associated industries. With this in mind, the curriculum has been developed in close co-operation with the pharmaceutical industry.

For more detailed information about this course, please visit www.lincoln.ac.uk/u/phsc

“A really fascinating course with fantastic state-of-the-art facilities, which offers exciting opportunities for my future.”

Lucy Greeves
Pharmaceutical Science student
Research is a key focus within the School of Pharmacy. Staff and students work to translate the biological understanding of disease into future therapeutics, as well as to progress the development, application and efficacy of health technologies including drugs, their delivery strategies and safe use.

MSc by Research Pharmacy and Pharmaceutical Science
MPhil/PhD Pharmacy and Pharmaceutical Sciences

As researchers in the School of Pharmacy, students have the opportunity to engage in pioneering, translational and multidisciplinary research. Research in the School is grouped around two distinct strands: pharmacy education and community engagement with prescribing, and physical pharmaceutics and drug delivery.

Student researchers can receive training programmes to enhance research skills and support from dedicated academic supervisors.

Pharmacy researchers can benefit from the University’s close relationships with local healthcare providers including the United Lincolnshire Hospitals NHS Trust, with which we share professorial appointments, and the Lincolnshire Co-op. Students are encouraged to collaborate with researchers in other healthcare-related areas within the University, including the Lincoln Institute for Health which can provide support for those wishing to engage in clinical and patient-facing research.

Pharmaceutical Science researchers can benefit from excellent facilities in the Joseph Banks Laboratories and they are encouraged to collaborate with colleagues in the University’s Schools of Chemistry and Life Sciences to develop their research in the pharmaceutical sciences.

Research expertise

The School has five major disciplines around which research is grouped:
- Pharmaceutical Chemistry
- Physical Pharmacy and Drug Delivery
- Clinical Therapeutics
- Pharmacy Practice and Education
- Biological Chemistry.

Each area is linked by a focus on patient care and the theme of medicines optimisation, whether by drug discovery, synthesis, formulation or evaluation.

Research groups

The School of Pharmacy is involved in a wide range of different research centres and groups and our team work on lots of interdisciplinary research across the University. There is a particular focus on Drug Design and Delivery that builds upon expertise from the Schools of Life Sciences and Pharmacy. Similarly, there is a strong presence within the Lincoln Institute of Health.

Research topics

Within the five disciplines, examples of current research topics include:
- Polypharmacy and frailty
- Pharmacy-led clinical medication reviews
- Solid state drug development
- Particle synthesis of active pharmaceutical ingredients for nanomedicines
- Crystal engineering of salts/polymorphs/co-crystals
- Mucosal delivery of macromolecules
- Targeted delivery of biotherapeutics and nanomedicines
- Mucosal models to study drug delivery
- Bioconjugations
- Bio-inspired chemistry
- Biologic delivery
- Development of sequence selective DNA cross-linking agents
- Interprofessional education
- Antibiotics to combat drug-resistant bacteria.

"The philosophy of the School of Pharmacy is to produce passionate pharmacists and pharmaceutical scientists who are adept in addressing many of the major healthcare challenges that we will all face in the 2020s and beyond."

Dr Paul Grassby
Head of School

For more detailed information about our programmes, please visit the following pages of our website:

For the MSc by Research
www.lincoln.ac.uk/p/pscire

For the MPhil/PhD
www.lincoln.ac.uk/p/phar
Biotherapeutics delivery

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. These drugs include biotherapeutics (or “biologics”) such as peptides, proteins and nucleic acids, and offer tremendous therapeutic possibilities. However, their delivery is currently largely limited to administration by injection (e.g. insulin). Dr Vllasaliu aims to enable non-injection delivery of biotherapeutics, focusing on administration by mouth or through the lungs.

As biotherapeutics are complex and large molecular weight molecules, their absorption is severely restricted. Dr Vllasaliu is looking into ways to enhance the absorption of these drug molecules by temporarily modifying the absorption barriers (e.g. gut epithelium) or through the use of extremely small particles (nanoparticles) as drug carriers – an approach that is central to “nanomedicine”.

In his drug absorption and nanomedicine-related research, Dr Vllasaliu uses models of the intestinal and airway tissue, based on growth of human cells in the lab. Another aspect of his work involves exploring ways to improve these models, which can replace animal experiments in research.

Crystals could shape future pharmaceuticals

Professor Nicholas Blagden

Professor Nicholas Blagden is known for his research into crystal growth which is the science behind creating a crystal. In recent years, the pharmaceutical industry has become increasingly interested in organic crystals and their use in creating better performing drugs.

Many new drug discoveries are difficult to develop into viable dosage forms because of their inherently poor structural properties. For example, they are often poorly soluble, or problematic to crystallize and therefore the active pharmaceutical ingredient is difficult to dissolve.

Professor Blagden is involved in research exploring the formation of co-crystals with small drug molecules or biologics and their potential use in drug delivery. One potential method of improving the solubility of certain drugs is to form a co-crystal of the drug with another pharmaceutically accepted material.

Antibiotics to combat drug-resistant bacteria

Dr Ishwar Singh

Antibiotic resistance is spreading faster than the introduction of new medicines into clinical practice, causing a public health crisis.

Dr Ishwar Singh’s research has resulted in the production of two synthetic derivatives of teixobactin – the world’s first known antibiotic capable of destroying ‘drug resistant’ bacteria.

Last year, the antibiotic teixobactin was discovered by researchers in the USA and was a key step in the fight against antimicrobial resistance.

Teixobactin, which kills a range of pathogens without detectable resistance, was isolated from microorganisms which do not grow under laboratory conditions found in soil – the natural source of nearly all antibiotics developed since the 1940s.

Dr Singh, a specialist in novel drug design from Lincoln’s School of Pharmacy, said: “Teixobactin originally evolved in soil to kill the bacteria around it, so our challenge was to produce the antibiotic synthetically. The method we created to do this uses commercially available ‘building blocks’ with a single purification step, and we are delighted with the results – we are now able to present the total synthesis of two derivatives of teixobactin.”

Dr Singh and his colleagues will now carry out further tests to more clearly understand the chemical properties of teixobactin and to simplify the molecule so that other derivatives can be produced. He hopes to create a library of teixobactin derivatives which could prove vital for the future development of the antibiotic.
Learn from Experts

In the School of Pharmacy, teaching staff include experienced and practising academics who are conducting innovative research projects with the potential to impact on society and improve the standards of practice within pharmacy and pharmaceutical science.

The clinical team

Our team of practitioner pharmacists, from both primary and secondary care areas, share their experience of patient care with the aim of developing students’ knowledge and skills for contemporary pharmacy practice.

Learning from current healthcare practitioners can enable students to bring to life the theoretical aspects of clinical pharmacy, with its rich underpinning of pharmaceutical science. This is key if students are to be effective in caring roles, where patients present with complex, not textbook, healthcare needs and social backgrounds.

The clinical team plays an essential role in supporting students’ personal and professional development as they prepare for their chosen careers.

Leading academics appointed

Dr Tobias Gruber and Dr Richard Ngomba, both noted for their work in specialist areas of medical research, have recently joined the School of Pharmacy at Lincoln.

Dr Gruber’s research examines how selective receptors in the brain react to different bioactive substances. A bioactive substance is one that has an explicit effect on a living organism or living tissue, such as a vaccine or an antibiotic. Dr Gruber’s work has explored new types of antibiotics and their effect on human receptors.

Dr Ngomba has led extensive investigations into the science behind neurological conditions such as epilepsy, schizophrenia, attention disorders and stroke. He specialises in the study of neurobiology at a cellular level and at the University of Lincoln he will continue his work scrutinising the causes and triggers of neurological conditions.

Both Dr Gruber and Dr Ngomba are based at the University’s Joseph Banks Laboratories on the Brayford Pool Campus.

Mark Brennan

Director of Pharmacy Education and Deputy Head of the School of Pharmacy

Mark is a key member of the School of Pharmacy. He provides strategic leadership for education and is responsible for the overarching student experience in the School. He also teaches across a range of areas including healthcare law, practice, and ethics.

Mark started his career in pharmacy practice but has spent more than 20 years in higher education, developing MPharm programmes and in senior academic roles relating to the enhancement of teaching and learning. He is currently leading the University’s interprofessional education strategy, which enables students from diverse health and social care backgrounds to learn with and from each other in order to improve care.

Mark acts as an advisor to national and international professional bodies in relation to the assessment of future healthcare professionals and the accreditation of pharmacy programmes. He is a Fellow of the Higher Education Academy and has a Master’s Degree in the Legal Aspects of Medical Practice from Cardiff University.

Dr Emma Wright

Lecturer in Pharmaceutics

Dr Wright’s research currently focusses on developing biomaterials and drug delivery devices. Previously, she developed a polymer system to help reduce internal trauma associated with keyhole surgery and was involved in developing a film coating for orthopaedic implants in order to reduce biofilm formation, one of the leading reasons for implant failure.

Dr Wright went to medical school before studying medicinal chemistry and then took a PhD in pharmaceutics, which means she can take into account the patient perspective as well as work at a molecular level.

Dr Wright lectures on diverse topics including wound healing, polymer material science and drug formulation. She has carried out research at a number of institutions in multidisciplinary teams with some world-leading scientists and clinicians.

To find out more about our current School of Pharmacy academics, please visit www.lincoln.ac.uk/lsp/schoolstaff

Teaching within the school is really diverse, ranging from workshops and clinical sessions, to lectures and lab work. The enthusiasm of staff is addictive and makes for a great learning environment.

Victoria Root
MPharm Pharmacy student
Discover our Facilities

The University of Lincoln’s award-winning* city centre campus provides a modern student-centred environment. As a student in the School of Pharmacy, you will have access to specialist equipment and purpose-built facilities to help you develop the practical skills necessary for your future career.

Joseph Banks Laboratories
The Joseph Banks Laboratories are the result of a £14 million redevelopment project designed to provide science students with professional-standard facilities in which to study at undergraduate and postgraduate level. The development is part of a new Science and Innovation Park, a joint venture between Lincolnshire Co-op and the University. The design of the building integrates research, teaching and social spaces into a single connected learning landscape.

For School of Pharmacy students, the Joseph Banks Laboratories offer specialist clinical and teaching spaces such as the Maltby Suite which comprises a medicines information suite and consultation rooms.

Specialist equipment is available for:
- High-performance liquid chromatography
- Gas chromatography
- Mass spectrometry
- Imaging suite
- Real-time polymerase chain reaction
- Atomic absorption spectroscopy
- X-ray crystal diffractions.

Science Building
In addition, our purpose-built Science Building contains large laboratory spaces, including specialist teaching areas for molecular and cell biology and a class 2 level containment laboratory for microbiology. All laboratories are equipped with large displays connected to an audio visual system that are used for demonstrations during practical work.

Great Central Warehouse Library
A dedicated subject librarian can help you to navigate and locate a wide range of subject-specific print and electronic resources in our Great Central Warehouse Library.

*Please visit estates.lincoln.ac.uk/news/awards for further details.

The science park benefits students, businesses, the city and county as a whole, bringing employment, innovation and education together.

Ursula Lidbetter
Chief Executive, Lincolnshire Co-op
Careers in Pharmaceutical Science and Pharmacy

University of Lincoln graduates can go on to careers in private, public and third sector organisations. Lincoln has an excellent track record for graduate employment, with more than nine out of ten graduates in employment or further study within six months of finishing their course, according to the latest Destinations of Leavers from Higher Education survey, as provided by unistats.com.

Career opportunities

Pharmacy

Career prospects for pharmacists can be excellent if they have developed the unique and diverse skills necessary to take responsibility for optimising the safe and effective use of medicines.

Roles for pharmacists have traditionally been in community and hospital pharmacies. Within community pharmacy practice, the role of the pharmacist is continually expanding to include early diagnosis, medication reviews and public health initiatives, particularly in ‘healthy living’ pharmacies. Within hospital pharmacies, pharmacists can work as full-time clinical pharmacists, providing direct care to patients and they may go on to achieve consultant status.

Many pharmacists are now independent prescribers and exciting opportunities are developing for appropriately trained pharmacists to care directly for patients alongside General Practitioners within primary care. Recent Government initiatives are supporting this aim of integrating pharmacists within the multidisciplinary primary care team.

Pharmacists are also found within the pharmaceutical industry and regulatory bodies, undertaking a variety of roles such as research and development, or regulatory and drug safety roles. In addition, the transferable skills such as communication, problem-solving and decision-making that the MPharm at the University of Lincoln aims to develop, are valued in many other fields of employment.

Opportunities exist at Lincoln should students wish to stay on after they complete their MPharm degree.

The University currently offers a PGCert Postgraduate Certificate in Non-Medical Prescribing which provides students with the opportunity to develop their skills and the specific competencies required to prescribe safely, effectively and appropriately within their own area of professional expertise. Students may wish to further their studies at MSc by Research, MPhil or PhD level. For details of these programmes, please visit the University of Lincoln website.

Pharmaceutical Science

The University’s Pharmaceutical Science course is designed to ensure that 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. Students may wish to study further at MSc by Research, MPhil or PhD level. These opportunities exist at Lincoln should students wish to stay on after they complete their Pharmaceutical Science degree.

Careers guidance

A number of specialist services are available to students.

The School of Pharmacy currently has a Careers & Employability Advisor and a member of staff dedicated to helping with graduate employability. Students can access drop-in clinics, which aim to provide personal guidance appointments.

All students can access careers information and guidance through the Careers & Employability Team, including advice and support on developing a CV, applying for jobs and obtaining paid and voluntary work experience while studying. The University’s award-winning business incubator, Sparkhouse, is on hand to help those who wish to set up their own businesses.

For more information on the full range of services available from the Careers & Employability Team at Lincoln

www.uolcareers.co.uk
Find Out More

There are many ways for you to engage with the School of Pharmacy and the University of Lincoln. Whether you want to visit us and take a look around, join our online community or find out more information, we are here to help.

Call us on +44 (0)1522 886644, email enquiries@lincoln.ac.uk or read on to find out ways to get in touch.

Open Days
The University holds Open Days throughout the year, which offer a great opportunity for you and your family to explore the campus, speak to lecturers and find out more about student life at Lincoln. To find out more and to book your place, please visit www.lincoln.ac.uk/opendays

Postgraduate visits and masterclasses
At a postgraduate masterclass, there are opportunities to take part in a lecture or workshop, as well as to meet our academics and other prospective students.

Social media
To keep up-to-date with the latest news and information from the University, join our online communities. See opposite for our handles, names and addresses.

International students
The University of Lincoln aims to provide a vibrant and dynamic atmosphere for international students who are looking to study in the UK. Please visit www.lincoln.ac.uk/international for more information.

We want you to have all the information you need to make an informed decision when you are considering which courses and Higher Education providers to apply to.

We encourage you to visit our website for the most comprehensive information, as well as looking at our prospectus, course brochures and visiting us at an Open Day.

The course listings on our website provide detailed information including a full list of core and optional modules, details on fees, and information on any additional costs that you might incur on a particular degree, as well as accommodation costs. Information about the way you will be assessed on your course, where you will study, the staff involved in your teaching, entry requirements and application details can also be found on our website.

For full admissions terms and conditions, please visit: www.lincoln.ac.uk/terms
Open Days

Please visit our website to book your place at one of our Open Days.
www.lincoln.ac.uk/opendays