



Faculty of  
Science

## PHARMACY FAQs

# NUS-Faculty of Science Open House 2023

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## DIFFERENCES WITH OTHER PROGRAMMES

### 1. What is the difference between pharmacy and pharmacology?

Pharmacology is the branch of biomedical sciences that is concerned with the study of drug action, which exerts a biochemical and/or physiological effect, on the cell, tissue, organ, or organism.

Pharmacy is a health profession where pharmacists are responsible to ensure people and patients get the best outcomes from their medicines. Pharmacology is an essential subject within the syllabus of the Pharmacy programme.

### 2. What are pharmaceutical sciences?

Pharmaceutical sciences are fundamental to your practice as a pharmacist. Pharmacists are unique as healthcare professionals in having strong pharmaceutical sciences foundations.

Pharmaceutical sciences belong to a branch of science that comprises a range of scientific subjects dealing with various aspects of discovery, development, formulation, manufacturing as well as the quality assurance of pharmaceutical substances. Some examples of subjects that are classified under pharmaceutical sciences include biopharmaceutics, biotechnology, medicinal chemistry, pharmaceutics, pharmaceutical technology, pharmacogenomics (stratified medicine) and pharmacokinetics/pharmacodynamics.

We also offer a four-year degree programme B.Sc. and B.Sc. (Hons) majoring in Pharmaceutical Science. This degree provides deeper training on pharmaceutical sciences, but does not lead to a professional license to practise as a pharmacist in Singapore. If you are keen in the science of medicines and aspire to seek future employment in the pharmaceutical industry, you may consider this option. More information can be found in separate brochures and also on the Department of Pharmacy website (<https://pharmacy.nus.edu.sg/>).

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## PROGRAMME INFORMATION

### 3. Who are pharmacists?

Pharmacists are registered healthcare professionals (registered with the Singapore Pharmacy Council) who are committed to ensuring the best outcomes from medication therapy through patient-centred care. Pharmacists do this by:

- Educating and advising patients, caregivers and health professionals on the responsible use of medicines and medicine-related devices;
- Working with the other health care professionals to ensure patients get the correct medicine at the correct dose at the correct time;
- Helping patients adhere to their medication regimens;
- Supporting adverse-event and medication-error reporting programmes in the interest of promoting patient safety;

- Raising public awareness that more positive health outcomes and important cost savings can be achieved when patients, physicians and pharmacists collaborate in selecting, monitoring and adjusting medication therapy;
- Deploying informatics within our healthcare system.

Pharmacists are employed across every aspect of our healthcare system including our hospitals (acute and community), medical centres, intermediate and long-term care facilities, polyclinics and retail pharmacies. Pharmacists are also increasingly working beyond healthcare institutions, delivering pharmaceutical care services directly in the community (e.g. visiting Singaporeans in their homes to review if they are using their medicine optimally).

By virtue of their training, pharmacists are also experts in the development and distribution of medicines and therefore discharge important leadership roles across the pharmaceutical industry (manufacturing and commercial) and government agencies whose remit includes access to, and the quality of medicines (e.g. ALPS, IHiS (Integrated Health Information Systems), HSA (Health Sciences Authority)).

*Reference: CENTENNIAL DECLARATION, Improving Global Health by Closing Gaps in the Development, Distribution, and Responsible Use of Medicines (FIP, 2012).*

#### 4. What is the overall programme structure like?

All courses are integrated around specific themes rather than specific disciplines. This means that there is no course, for instance, on chemistry but rather, chemistry is integrated into courses in the programme so that the relevance of chemistry to your future practice as a pharmacist is explicit. Themes of Year 1 include professionalism, practiceskills, foundational knowledge and finally, how to optimally manage medicines that are used for simple conditions of the skin and eyes. In Years 2 and 3, the themes of professionalism and skills are further developed. At the same time, you will learn about how medicines maintain health, prevent, treat and cure illnesses in all the other major physiological systems of the body (from the head to the heart). In your final year (Year 4), we bring all this learning together so that you can rise to the challenge of managing medicines for patients.

Interprofessional education is essential in your journey to being a competent pharmacist as care is increasingly delivered in collaborative teams rather than by individual healthcare professionals. For these reasons you will undertake the Common Curriculum for Healthcare Professionals (CCHP) in the first two years of your studies as part of the B.Pharm. (Hons.) programme. The CCHP comprises of five courses which are: (i) Social and Behavioural Determinants of Health (Year 1), (ii) Professionalism and Communication (Year 1), Data Literacy (Year 1), Professionalism and Teamwork (Year 2), and Digital Literacy (Year 2). The CCHP is delivered through team-based learning so you will be assigned to a team of 8 students who are drawn from the Alice Lee Centre for Nursing Studies, the Faculty of Dentistry, and the Yong Loo Lin School of Medicine. The CCHP sets the foundations for inter-professional education which will be further developed when you undertake clinical training in Year 3 and 4 of the B. Pharm. (Hons.) programme.

In every year of the programme we integrate work-based learning (otherwise referred to as Pre-Employment Clinical Training) (PECT) with on-campus studies. This purposeful integration means your academic studies are always contextualised to real-world practice, which not only gives your learning greater meaning but also prepares you to be an independent practitioner. Your PECT begins in Year 1 when as part of an inter-professional team, you will visit the home of an elderly Singaporean citizen. This supervised visit, debriefing and structured reflections will provide invaluable insights into what it means to be a patient, the reality of living with illness, and the immeasurable privilege of being the healthcare professional in whom such trust is placed. There are PECT rotations in each of the subsequent three years of the programme which culminates in two large rotations of 11 weeks where you will experience work-placed based learning in both patient care (e.g., polyclinics) and indirect patient care (e.g. biopharma) settings.

In Year 3 of the programme, you will have the opportunity to generate new knowledge through the SCIPhI (student-led Collaborative Innovative Pharmacy Inquiry) Project. This SCIPhI Project is integrated into the world of pharmacy practice pharmaceutical science as the research questions you will be answering will be a real-world problem set by clinical practitioners and scientists who are affiliated with our department. As part of a team, you can apply your research skills in finding solutions to the problems and then presenting and defending those solutions to the clinical practitioners and scientists.

In Year 4 of the programme, we also empower you to *Lead the Future of Pharmacy* by developing your leadership skills and equipping you with a toolkit to go about healthcare reform on graduation. We will build your competencies in healthcare economics in the course *Introduction to Healthcare Economics* so that you can ensure that individual patients can afford their medicines and that the wider Singaporean healthcare systems is sustainable. Finally, you will undertake the course *Integrated Management of the Multimorbid Patient* which will integrate your pharmaceutical science and therapeutics from the previous three years of the programme so that you can be ready to encounter your first complex patient on graduation.

You may also expand your horizons by participating in other programmes offered by the University or Faculty e.g. University Scholar Programme, University Town College Programme, NUS Overseas College Programme, Student Exchange Programme

(in Summer), and the Undergraduate Research Opportunities Programme in Science (UROPS).

## 5. What is the programme duration?

The Pharmacy programme is a four-year professional programme. You will be admitted directly into the Pharmacy programme in the first year of study. At the end of the four years, graduates are conferred a professional degree in Pharmacy, while those who have demonstrated good academic performance over the four years will be awarded an honours professional degree in Pharmacy. As earlier mentioned (see section 4), in addition to the Common Curriculum for Healthcare Professionals (CCHP) during Years 1 – 2 of the programme, and Pre-Employment Clinical Training (PECT-I) during Years 1 - 3 of the programme, you will undertake two 11-week rotations of full time PECT (PECT-II) at the end of Year 3 and beginning of Year 4 of the programme.

Graduates with a Pharmacy degree from NUS may apply for registration with the Singapore Pharmacy Council (<https://www.healthprofessionals.gov.sg/spc/becoming-a-pharmacist>) upon the satisfactory completion of a further 30 weeks of pre-registration training. The in-programme PECT-II and post-programme workplace training will constitute the mandatory 12-month pre-registration training required for registration.

## 6. What will I learn in NUS in order to become a pharmacist?

### Knowledge, Skills, Attitudes and Values

- To develop understanding of pharmacy practice and the underpinning basic, applied and pharmaceutical sciences, skills, attitudes and values that will guide you for your lifelong career as a registered pharmacist.

### Ethics

- To encourage you as a student and as a pharmacist to adhere to the highest standards of professional conduct, always giving top priority to serving the best interests of your patients and wider Singaporean society;
- To support the confidentiality of patient information through diligent application of privacy standards and compliance with the law including the Personal Data Protection Act.

### Innovation

- To foster innovative solutions in how to develop new sustainable services that promote the responsible use of medicines.
- To lead on the use of healthcare informatics across our healthcare system in order to improve the quality and ensure the sustainability of our healthcare system.

### Leadership

- To influence wider society by contributing to policy-making to ensure safe and sustainable systems for the development, control and responsible use of medicines in Singapore, the ASEAN region and globally.

## 7. Why is pharmacy regarded as a professional degree?

You are only able to practise as a pharmacist in Singapore if you have successfully completed the professional integrated degree in Pharmacy and are registered with the Singapore Pharmacy Council (<https://www.healthprofessionals.gov.sg/spc>). Therefore, the degree is a prerequisite for entry into the profession. The registration of pharmacists is governed by the Pharmacist Registration Act. Registered pharmacists are obligated to abide by the laws that govern pharmacy practice, and demonstrate good ethical and professional responsibilities (by adhering to the Code of Ethics) towards the care of patients.

## 8. Are there additional requirements for one to be a student pharmacist?

Yes. A pharmacist is a registered healthcare professional who is committed to ensuring the best outcomes from medication therapy through patient-centred care. Therefore, at all times, the behaviour of pharmacy students must justify the trust that the public places in the pharmacy profession, including when you are on supervised training (PECT-I and PECT-II) throughout the four years of the programme. This Fitness for Clinical Training is demonstrable through the acquisition of competency, good character and behaviour as well as the possession of good physical and mental health. Such requirements can go beyond the standard criteria for tertiary education, and they also take into consideration the ability to handle different aspects of the programme including laboratory training, and industrial and clinical internships. We provide such guidelines for Fitness for Clinical Training at <https://pharmacy.nus.edu.sg/study/undergraduate/bachelor-of-pharmacy/>, with coverage similar to those released for other pharmacy programmes elsewhere in the world.

## 9. Are there any health screening requirements for Pharmacy students?

In accordance with the Singapore Ministry of Health requirements, students enrolled in a healthcare professional programme must undergo health screening and vaccination requirements (including having completed all covid vaccinations). Knowing your health status will enable you to protect yourself and patients during your course of study, in particular when you embark on clinical training, which can be referred to as Pre-Employment Clinical Training (PECT). Refer to vaccination requirements in the website: <https://pharmacy.nus.edu.sg/study/undergraduate/bachelor-of-pharmacy/>.

## APPLICATION/ADMISSION

### 10. What are the prerequisites for admission into Pharmacy?

You will require very good passes in Chemistry (H2) and in either Biology (H2) or Physics (H2) or Mathematics (H2) or Further Mathematics (H2) at 'A' Level (or equivalent) examinations. For information on the Indicative Grade Profile and Course Places for the Pharmacy Programme (Direct Admission) in Academic Year 2022/2023, please go to <http://www.nus.edu.sg/oam/gradeprofile/sprogramme-igp.html>. For information on application, please go to the NUS website and read the relevant application procedures for the respective groups of applicants (<http://www.nus.edu.sg/oam/apply-to-nus/application>).

### 11. How many students are accepted each year?

We receive a large number of applications each year. Based on the admission exercise of the previous year, approximately 150 students are admitted into the programme.

### 12. Is it possible to enter the Pharmacy programme without 'A' Level Biology?

'A' Level Biology (H2) (or the equivalent) is not a compulsory subject prerequisite for application to the Pharmacy programme in NUS. Therefore, prospective students may apply to read Pharmacy without 'A' Level Biology. However, 'A' Level Chemistry (H2) (or the equivalent) remains as the only compulsory prerequisite subject for entry to the Pharmacy programme.

### 13. May I apply again if I am denied the first time?

The Pharmacy programme is highly competitive and we receive a large number of applications each year. Please write to [askBPharm@nus.edu.sg](mailto:askBPharm@nus.edu.sg) for advice should you wish to apply again.

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## OTHER INFORMATION

### 14. What about student life?

There are abundant student life opportunities for you to hone your talents and soft skills. These include NUS Pharmaceutical Society (NUSPS), a student-led organisation which comprises several sub-committees (e.g., media resource team, international relations) that work closely together with the mission to engage and empower the student body. By creating internship opportunities, organising career talks/seminars and field trips, NUSPS provides exposure to the diverse career tracks that are open to you upon graduation. NUSPS also promotes and raises public awareness of the pharmacy profession and the pharmaceutical sciences through numerous community outreach activities. You can contribute actively to NUSPS by serving in various committees and in the process, develop interpersonal, leadership and networking skills, amongst many others.

You can also participate in other special activities/projects e.g., Pharmacy Youth Expedition Project (YEP), spend a year at one of the NUS Overseas Colleges programmes (<https://enterprise.nus.edu.sg/education-programmes/nus-overseas-colleges>), or participate in overseas exchange programmes. These experiences will develop your entrepreneurial acumen and broaden your horizons.

If you are interested in embarking on a research career, you can participate in the Undergraduate Research Opportunities in Science (UROPS) programme under the close supervision of experienced Pharmacy faculty members. These research opportunities are open to you as early as in Year 2. In Year 3, all students will undertake as part of a team the SCIPhI (student-led Collaborative Innovative Pharmacy Inquiry) Project, and you and your team will have the opportunity to showcase and present your research work from SCIPhI to employers and in local and even international conferences.

### 15. Are pharmacy undergraduates allowed to go for exchange programmes?

The integrated Pharmacy curriculum does not offer options for semester-long exchange programmes. This is not unusual for a programme which leads to registrations as a healthcare professional as there is a significant core syllabus of knowledge, skills, attitudes and values that all students have to undertake. You are, however, encouraged in Years 1 and 2 to take part in summer exchange programmes during the university vacation period from May to July.

## 16. How will I learn at NUS?

We have embraced active learning in our integrated professional programme. Active learning is different from passive learning in that you are much more participatory in the learning process – for example, a lecture in which you sit, listen and learn is regarded as a passive learning, whereas in an Interactive Class (IC) you are expected to listen, respond to questions, and share your experiences and opinions.

There are various types of active learning activities throughout our programme that suit a variety of learning styles. For example, ahead of an IC, you are directed to read preparatory material so that your lecturer can engage you in the class where higher forms of learning such as analysis, synthesis, application and critical thinking will take place. Or you can prepare at home or wherever is convenient to you by being directed to short, engaging e-learning units that your lecturer will post on our learning management system (CANVAS). For Collaborative Learning Workshops (CLW), you will be part of an assigned team that will engage in enquiry around a case study that is presented to you by a multidisciplinary team comprising of scientists and clinicians. This team-based approach to integrated learning is the signature pedagogy of the programme. During practicals, you can conduct hands-on experiments which will give you a deeper understanding of the concepts in ICs and CLWs. You can also try out the skills you have acquired, refine them and practice them through our series skills workshops.

## 17. Will pharmacy graduates be able to switch to a totally different career path should they decide to do so upon graduation?

Yes, our professional pharmacy programme not only develops the competencies to be a pharmacist but it also develops transversal competencies that will give you the flexibility to pursue many careers. The specific transversal competencies which our programme develops and are valued by many different types of employers include communication skills, conflict resolution management skills, creativity, critical thinking ability, decision-making skills, healthcare informatics knowledge and skills, interpersonal relationship management, numeracy skills, self-directed learning skills, awareness in systems science and awareness in legislative regulation.

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## CAREER PROSPECTS

### 18. What are the career prospects for Pharmacy graduates?

Singapore's healthcare needs will only increase with time. With the number of senior expected to double in 2030, many of us will live with chronic conditions such as diabetes, dementia and cancer which will require us to take greater than five medicines (polypharmacy). This will certainly mean a greater demand for pharmacists across every aspect of our healthcare system including our hospitals (acute and community), intermediate and long-term care facilities, polyclinics, and retail pharmacies. Pharmacists are also increasingly working outside healthcare institutions and delivering services directly in the community (e.g., visiting Singaporeans in their homes to review if they are using their medicine optimally).

Pharmacists are also experts in the development and distribution of medicines and therefore discharge important leadership roles across the pharmaceutical industry and government agencies whose remit includes access to medicines and the quality of medicines.

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