

LEE KONG CHIAN
SCHOOL OF
MEDICINE



NANYANG
TECHNOLOGICAL
UNIVERSITY
SINGAPORE

Imperial College
London



Lee Kong Chian
School of Medicine

PhD by Research
Programme

Lee Kong Chian School of Medicine

The Lee Kong Chian School of Medicine, a partnership between Nanyang Technological University, Singapore (NTU Singapore) and Imperial College London (Imperial) is training doctors who put patients at the centre of their exemplary care. The School, which offers both undergraduate and graduate programmes, is named after local philanthropist Tan Sri Dato Lee Kong Chian. Officially opened on 28 August 2017 by Singapore's Deputy Prime Minister Mr Teo Chee Hean, LKCMedicine aims to be a model for innovative medical education and a centre for transformative research. The School's primary clinical partner is the National Healthcare Group, a leader in public healthcare recognised for the quality of its medical expertise, facilities and teaching.

MESSAGE FROM THE DEAN

While the establishment of the Lee Kong Chian School of Medicine (LKCMedicine) is committed to train doctors, our institution is also driven to delve deep into research that will improve health and wellbeing.



The LKCMedicine PhD by Research Programme is a key node in the School's research ambitions and strategy. Inaugurated in January 2016, the programme is designed for the brightest students from diverse backgrounds – from medicine to engineering to social sciences. I am pleased to say that our first batch of students is doing extremely well, reaping opportunities to work with leading researchers in LKCMedicine and our partner institutions.

Throughout the four-year programme, the students take on challenging and transformative research within the School's five research domains: **Lifespan Medicine, Population Health, Medical Biology, Medical Engineering and Medical Education Research**, with a choice to focus on the programmes of Cardiorespiratory and Metabolic Health, Infectious Diseases, Neuroscience and Mental Health, Population Health and Health Services Research, Systems Biology, Regenerative Medicine and Developmental Biology, Medical Education Research as well as Health Technologies, Nanomedicine and Bioengineering – themes closely linked with Singapore's challenges in caring for its rapidly ageing population.

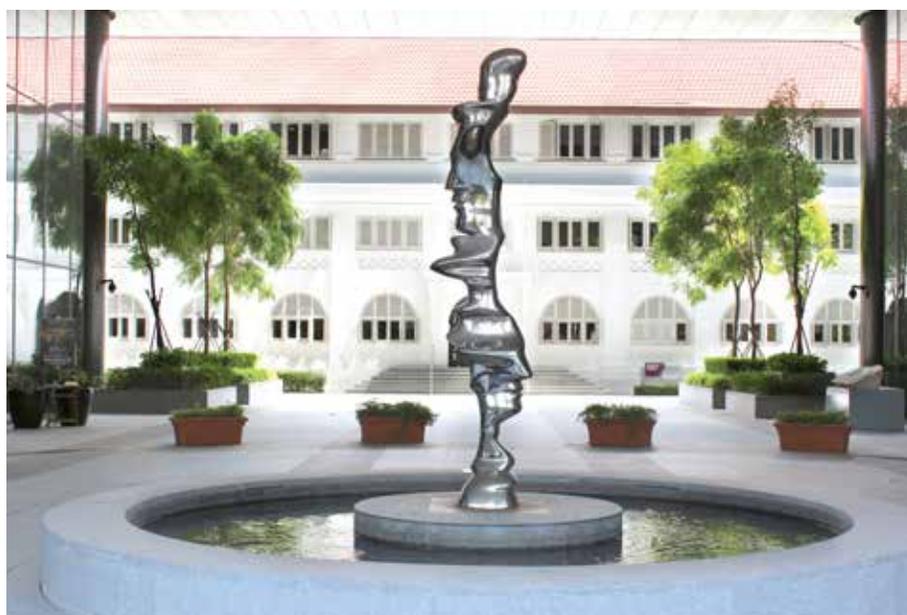
To broaden their horizons, this programme also offers valuable overseas exchange opportunities. For instance, students who choose research topics with a co-supervisor from Imperial College London will spend between 12 and 18 months at this world-renowned institution.

We also have a PhD programme with the University of Exeter (UoE) UK. A world-class research university, UoE is a member of the Russell Group of leading research-intensive universities. Upon completion of the programme, graduates will be awarded PhD degrees from either NTU Singapore or UoE.

It is our belief that our PhD graduates will make a difference to their community and the rest of the world, having acquired in-depth intellectual, research and analytical skills.

If you have a strong inclination towards research that improves the lives of patients, the PhD programme is the ideal choice to further your passion.

Yours sincerely,
Professor James Best
Dean, Lee Kong Chian School of Medicine



ABOUT THE PROGRAMME

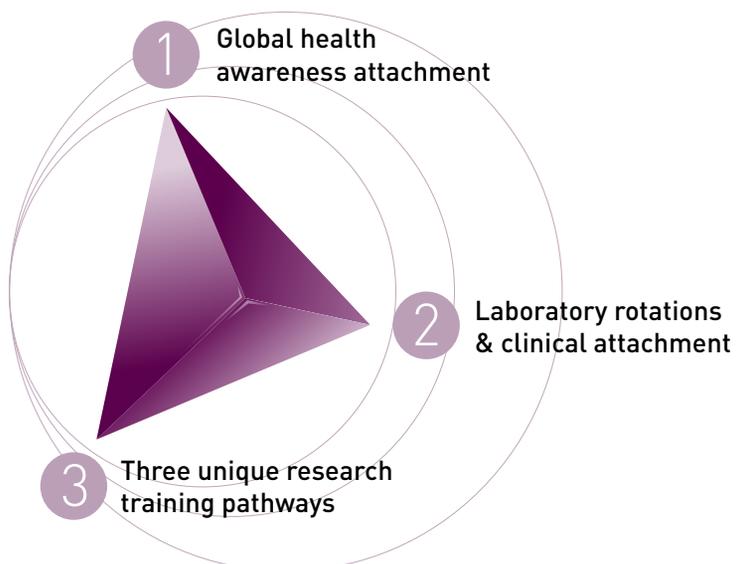
The LKCMedicine PhD by Research Programme admits students from a variety of backgrounds – natural science, medicine, social science and engineering, and exposes them to a range of topics and disciplines such that on completion, graduates will have a deep knowledge and appreciation of both translatable and translational medical research methods.

It is designed to train and equip students with essential skills that will enable them to conduct cutting-edge research in one of the following domains:

- Lifespan Medicine
- Population Health
- Medical Biology
- Medical Engineering
- Medical Education Research

DISTINCTIVE FEATURES

The four-year programme has three distinctive features:





CURRICULUM MAP

The LKCMedicine PhD by Research Programme is designed to train and equip students with the technical and analytical skills essential to address the School's key research in Cardiorespiratory and Metabolic Health, Infectious Diseases, Neuroscience and Mental Health, Population Health and Health Services Research, Systems Biology, Medical Education Research, Regenerative Medicine and Developmental Biology, Health Technologies, and Nanomedicine and Bioengineering. Students receive broad exposure to a wide range of expertise within the School and NTU before specialising in their chosen research area.

LKCMedicine PhD students undertake the following:

YEAR 1

- Two core & two elective modules
- Clinical awareness attachment
- Global health awareness attachment
- Laboratory rotations
- PhD qualifying examination

YEAR 2 & 3

- Thesis writing course
- Main research project, for which you can choose one of the three pathways. Undertake a project:
 - Entirely at LKCMedicine; or
 - With an industry placement; or
 - With a placement at Imperial College London (12 to 18 months)

YEAR 4

- Complete main project at LKCMedicine
- Thesis preparation and submission



CURRICULUM OVERVIEW

▶ YEAR 1

Courses Offered to LKCMedicine PhD Students

Type	Course Code and Title	Semester
Core	MD9001 The Ethics & Practice of Research	1 & 2
	BS7107 Computational Biology and Modelling	2
Core / Elective	MD9101 Biostatistical Methods & Basic Epidemiology	2
	MD9104 Introduction to Neuroscience: Cellular and Molecular Neuroscience	1
	MD9105 Systematic Reviews and Evidence Synthesis	1
	MD9107 Latest Development in Infectious Disease Research	2
	MD9110 Advanced Genetics in Diseases, Ageing & Cancer	1
	MD9111 Development, Stem Cell Biology and Regenerative Medicine	1
Elective	MD9102 Bio-Entrepreneurship	1
	MD9103 Biological Imaging	1 & 2
	MD9106 Emerging Omics Technologies for Systems Biology & Personalised Medicine	1
	MD9108 Neural Systems and Behaviour	2
	MD9109 Professional Skills for Researchers	1
	BS7001 Foundation Course in Molecular & Cell Biology	2
	CH7102 Cell Therapeutics Engineering	2

Following are the curriculum requirements for clinician and non-clinician PhD students:

Requirements	Clinician	Non-Clinician
Two core courses	✓	✓
Two elective courses	✓	✓
ERI701 Epigeum Research Integrity Course	✓	✓
Attendance at Research Seminars	✓	✓
HWG707 Research Communication in Medical Sciences (July 2019 intake onwards)	NA	✓
HWG703 Graduate English, if applicable	NA	✓
HWG702 Teaching Assistant Programme, if applicable	NA	✓
Report for first laboratory rotation	NA	✓
Report for second laboratory rotation	NA	✓
Report for Clinical Health Awareness attachment	NA	✓

Assessments

Students will be assessed on the following during Year 1:

1. Performance in in-course assessment and/or written examinations of the modules conducted at the end of each semester
2. Quality of written reports and presentations of the rotation projects. Results (if any) of each mini-project should be written in the form of a scientific paper (1 to 2-page), for evaluation at the PhD Qualifying Examination in due course.
3. Quality of written reports (1000 to 1500 words) of the Global Health and Clinical Awareness attachments

Pass the PhD Qualifying Examination between 12 to 18 months from the start date of candidature. The examination includes: (i) literature review, (ii) research proposal and (iii) a report on research undertaken to date. Oral presentations are also required for items (ii) and (iii).

** The selection of the lab rotations will be guided by the student's preferred PhD research focus and in consultation with his/her supervisor. The rotations are meant to broaden the student's exposure to research within the School at an early stage of their training.*

▶ YEAR 2 & 3

- Attendance at Research Seminars
- Commence main research project and choose one of the following Pathways:

Pathway 1 - Mainstream

Undertake project at LKCMedicine

Pathway 2 - Industry aligned

Undertake project at LKCMedicine with industrial placement (6 to 12 months) in Year 3

Pathway 3 - Dual centre

- Undertake project conducted at LKCMedicine and Imperial College London (12 to 18 months) from second half of Year 2 to Year 3
- Applicants who have chosen research projects with a co-supervisor from Imperial College London will need to spend between 12 and 18 months at Imperial College London
- The School will cover all administrative costs associated with the attachment and the student is responsible for his/her travel and living expenses

▶ YEAR 4

- Attendance at Research Seminars
- Students on all three pathways complete their main project at LKCMedicine and prepare their thesis for submission.
- The PhD Thesis Examination consists of thesis, thesis defence in the form of an open seminar followed by a closed viva voce examination.



WHO CAN APPLY

Non-clinician applicants: At least Upper Second, preferably First class honours degree in a relevant field. A Master's degree is not a pre-requisite but is considered advantageous.

Clinician applicants: Bachelor of Medicine, Bachelor of Surgery (MBBS) or Doctor of Medicine (MD) graduates with identifiable research experience, preferably in the form of a Master's degree.

Applicants are also assessed on the feasibility of their research proposal, research experience and fundamental knowledge in their area in interest.

WHEN TO APPLY

There are two intakes each year: August and January. Please apply before the closing date for the preferred intake.

Admission intake	August	January
Application closing date	31 January	31 July

TALENT DEVELOPMENT

Scholarships with stipends will be awarded to outstanding applicants.

FROM THE PHD PROGRAMME DIRECTOR



Biomedical science is becoming increasingly complex, requiring researchers who are adaptable and able to work across multiple disciplines. The LKCMedicine PhD by Research Programme is designed to prepare students for the challenges of this exciting and rapidly changing field. From the outset, our students are exposed to a range of experimental and analytical techniques, through the research group rotations and the core and elective modules. The Clinical and Global Awareness attachments provide unique experiences that help establish the context of our research. We are confident that our graduates will leave the School well equipped to become the research leaders of tomorrow.

Professor Philip Ingham FRS

PhD Programme Director

Toh Kian Chui Distinguished Professor and Professor of Developmental Biology

Principal Investigator, Developmental Genetics Laboratory

STUDENTS TESTIMONIALS

“The LKCMedicine PhD by Research Programme comes from a medical school that is a marriage between two top universities, Imperial College London and Nanyang Technological University, ensuring an endless stream of opportunities for translational medical research and collaborations.”

Lee Shuen Yee
PhD Candidate, Class of 2020



“The modules have been useful in exposing me to new technologies and study methodologies. I was able to think about my chosen topic in depth and from many different angles and intend to apply this new knowledge to my clinical research projects beyond my PhD.”

Dr Barnaby Young
Clinical Appointment
PhD Candidate, Class of 2020

“The research atmosphere at LKCMedicine is world-class. I particularly love that there are no barriers between various lab groups and everyone is part of a big warm scientific family. By the end of this journey, I hope to achieve scientific excellence in my field of research as well as kick start a career in academia.”

Kelly Wong Li Lin
PhD Candidate, Class of 2021





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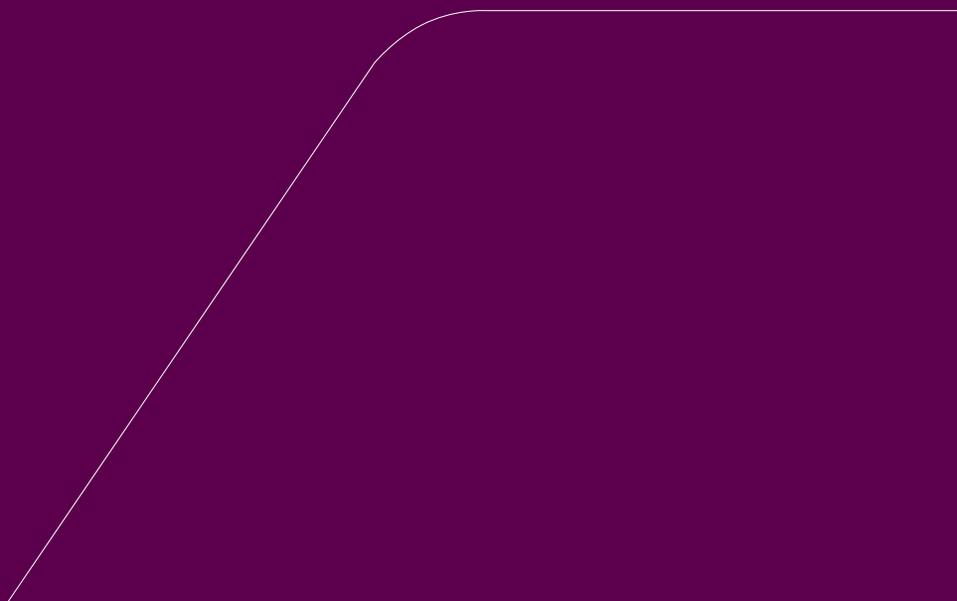


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PhD by Research Programme page

<http://www.lkcmedicine.ntu.edu.sg/Programmes/PhDProgramme/Pages/PhD-by-Research-Programme.aspx>



A photograph of the Lee Kong Chian School of Medicine building. The building is a multi-story structure with a white facade and a dark glass upper section. The white part has classical architectural details like columns and decorative window openings. In the foreground, there are two large, angular signs. The left one is purple and the right one is grey. There are green plants at the bottom of the frame.

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