



**DukeNUS**  
Medical School



# PhD

Programmes in

- ▶ Integrated Biology and Medicine
- ▶ Quantitative Biology and Medicine

**ADVANCING**

**MEDICINE THROUGH**

**SCIENTIFIC DISCOVERY**

# Message from our Vice Deans



As a leading medical research and education institution, Duke-NUS offers world-class research programmes that aim to substantially impact the local and global biomedical sciences landscape. Our faculty, staff and students have access to some of the world's most sophisticated biomedical research facilities and technologies. Our researchers are publishing in the top journals and winning fellowships, grants and awards. Most significantly, our researchers have been involved in several medical breakthroughs and have been informing health policymakers while changing medical practices. As Singapore continues to grow as a biomedical sciences hub, Duke-NUS provides an exciting and dynamic research environment for you to follow your passion in the field of biomedical science, and be at the forefront of advancing science to improve the practice of medicine.

**Professor Pat Casey**

Senior Vice Dean, Research



Welcome to Duke-NUS and the start of a great journey.

Embedded in our vibrant scientific community, we offer two outstanding PhD programmes to train researchers of the future. The unique setup of our research environment further offers opportunities to work on new discoveries for treating diseases. This gives our students the chance to be mentored by and work with our world-renowned scientists on cutting-edge research projects and major research collaborations.

More importantly, we strive to foster a community of young researchers that learn from each other, support each other and develop into the next generation of scientists. So far, we have prepared students for diverse careers in research, education, consultancy, government agencies and the private sector.

I invite you to explore and learn more about our programmes and research opportunities, as well as consider applying to one of our Duke-NUS PhD programmes.

**Associate Professor Silke Vogel**

Senior Associate Dean, Graduate Studies



# Our Story

Duke-NUS Medical School, established in 2005, is a landmark collaboration between Duke University in the USA and the National University of Singapore (NUS). It is Singapore's first and only US-style graduate medical school. Students can choose among an MD programme, three PhD programmes or opt to complete a dual MD-PhD degree.

We organise our research into five Signature Research Programmes (SRPs) that address the needs for developing treatments for diseases relevant to Singapore and Southeast Asia. In addition, our seven centres further integrate and augment research and learning at Duke-NUS.

Duke-NUS has also partnered with Singapore Health Services (SingHealth) to establish an Academic Medical Centre (AMC). The AMC is expediting our joint pursuits in clinical care, research and education to transform medicine and improve lives.



# Furthering Medicine through Research

We nurture our graduate students to excel in the biomedical and clinical sciences forming the foundation to develop disease treatments and improve preventive care. Their determination and skills of inquiry will pave the road to new and improved treatments for our patients.

## INTEGRATED BIOLOGY AND MEDICINE (IBM)

- Focuses on biomedical research in specific disease areas
- Enables researchers to take their research findings from “bench to bedside”

## QUANTITATIVE BIOLOGY AND MEDICINE (QBM)

- Focuses on design, quantitative and analytic issues in biomedical research
- Allows researchers to harness their quantitative capabilities
- Only such programme in Singapore

## CLINICAL SCIENCES AND TRANSLATIONAL SCIENCES (CTS)

- Prepares medical specialists and other health science professionals for leading clinical and translational research
- Focuses on interface between clinical, biological and social research methods
- Brings together experts from various sectors

Visit <https://www.duke-nus.edu.sg/education/our-programmes/phd/cts-phd> for more details on the CTS programme.

## Highlights



Prominent research institution with state-of-the-art research facilities



Innovative research programmes led by world-renowned faculty



Research programmes range from basic science to translational research



Distinctive PhD degree emphasising specific disease areas



The IBM PhD programme is a joint degree between NUS and Duke University



The QBM PhD programme uniquely focuses on biomedical data science research

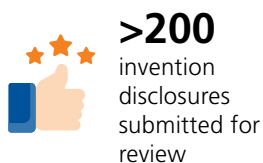
# Fostering a New Generation of Scientists

Duke-NUS trains PhD students across multiple disciplines and imparts essential skills and knowledge. Throughout their studies, the students learn to translate scientific discoveries into useful therapies for patients. Discover how our researchers and PhD students channel their curiosity and commitment to achieve research excellence.

## CREATING NEW SOLUTIONS



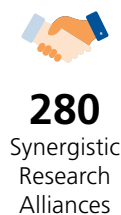
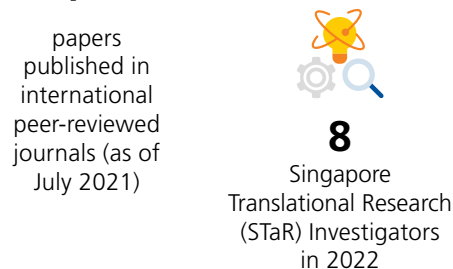
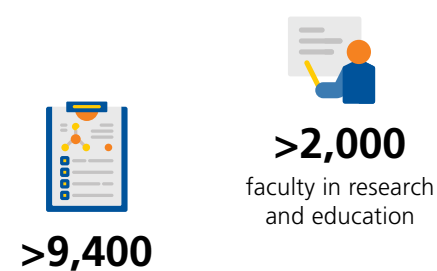
## FROM BENCH TO BEDSIDE



## CAREERS



## OUR RESEARCH BY NUMBERS



## PUBLICATIONS



Students have published

**>180 papers**

including 90 first-author papers in international peer-reviewed journals.

# Our Programmes and Centres

Our research focuses on five Signature Research Programmes (SRPs) addressing the research needs for developing treatments in Singapore and Southeast Asia.

Students in the IBM PhD programme will undergo scientific training with a thesis mentor from one of the SRPs. Meanwhile, QBM students will work with our data science centres.

## CANCER AND STEM CELL BIOLOGY (CSB)

Conducts basic cancer biology, stem cell research and clinical-translational studies with an emphasis on cancers affecting the Asian community.

## CARDIOVASCULAR AND METABOLIC DISORDERS (CVMD)

Investigates the clustering of metabolic syndrome, diabetes, hypertension, hyperlipidemia and cardiovascular disease to determine the underlying mechanisms and make translational discoveries that can impact clinical care.

## NEUROBIOLOGY AND BEHAVIOURAL DISORDERS (NBD)

Looks into molecular, developmental, cognitive and systems neuroscience, and translates discoveries into diagnostic and therapeutic strategies.

## 5 DUKE-NUS SRPs

## EMERGING INFECTIOUS DISEASES (EID)

Seeks and enhances innovative ways to diagnose, treat, prevent and control new and emerging infectious diseases.

## HEALTH SERVICES AND SYSTEMS RESEARCH (HSSR)

Focuses on the organisation, funding and delivery of health services for effective and sustainable healthcare.

Visit <https://www.duke-nus.edu.sg/education/our-programmes/phd/ibm-phd/specialty-tracks> for more details.







# PhD in Integrated Biology and Medicine (IBM)

Duke-NUS's PhD programme in Integrated Biology and Medicine (IBM) focuses on the study of disease mechanisms and translational concepts. It prepares students for a multitude of careers that cover a broad spectrum of disciplines including cell and molecular biology, biochemistry, physiology and health policy.

Our unique programme structure involves three lab rotations during the first semester to allow students to identify a setting matching their interests and passions.

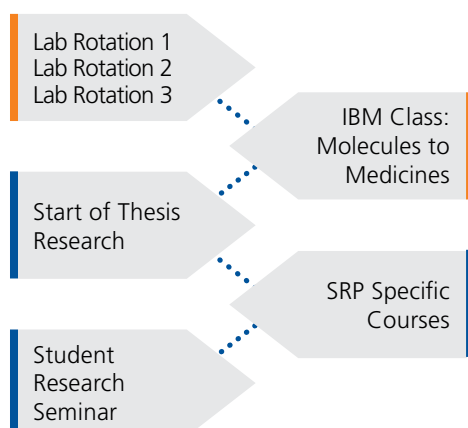
Typically, students take between four to five years to complete the programme.





# Curriculum

**Semester 1**   **Semester 2**   **Completion of PhD**



## YEAR 1

Students will attend the IBM core class “Molecules to Medicines” in their first semester. The class provides a foundation in biochemistry, biomedical research and experimental models, methods and mechanisms that drive current research investigations.

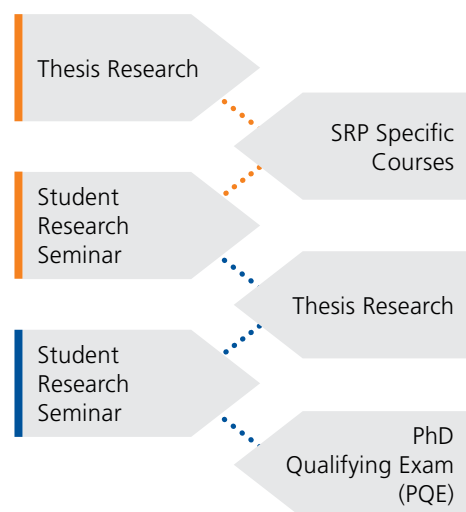
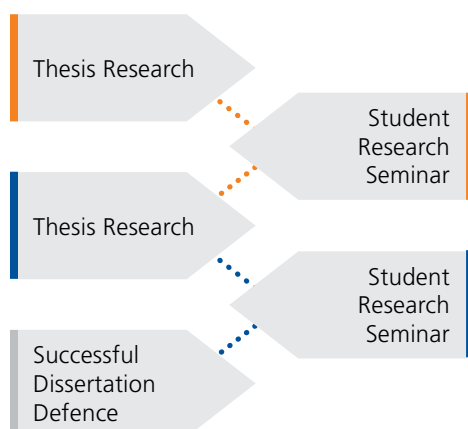
The students will embark concurrently on three six-week lab rotations from among the five Duke-NUS SRPs allowing them to explore their research interests.

In the second semester, students will begin participating in the Student Research Seminar which fosters the development and improvement of communication skills, evaluation of scientific literature and the sharing of individual research progress.

## YEAR 2

Students continue to develop their thesis projects and engage in class work pertaining to their respective SRPs and research areas.

They will defend a mock grant proposal during their PhD qualifying exam; a faculty committee will evaluate their fundamental scientific knowledge and ability to formulate hypothesis-based research.



## YEARS 3 TO 5

Our curriculum immerses students in research and inspires them to actively participate in research seminars and journal clubs.

The programme concludes with the completion of a written thesis and an oral thesis defence. Students are strongly encouraged to publish a first-author research paper before graduating.

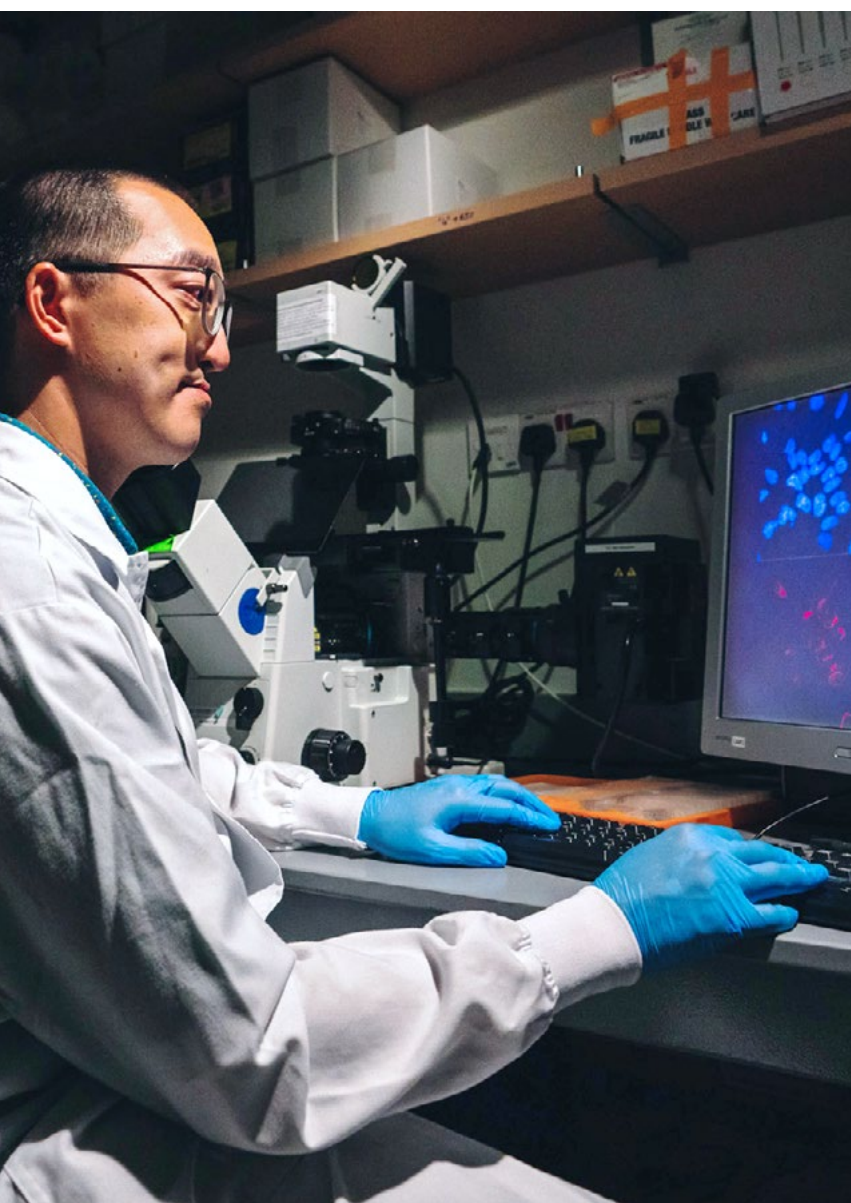
Visit <https://www.duke-nus.edu.sg/education/our-programmes/phd/ibm-phd> for more details.



# PhD in Quantitative Biology and Medicine (QBM)

Duke-NUS offers two concentrations under this PhD: Computational Biology and Biostatistics & Health Data Science. It is the only such PhD-granting programme in Singapore.

Our graduates are statistics-, computation- and data-savvy scientists with a firm understanding of biomedical research.



## Computational Biology (Bioinformatics)

Bioinformatics are now integral to biomedical research. Novel high throughput technologies will further drive the demand for bioinformatics experts.

### EMBEDDED IN THE CENTRE FOR COMPUTATIONAL BIOLOGY

Examples of Research Areas:

- Genome informatics
- Bioinformatics for next-generation sequencing
- Modelling of biological processes
- Image analysis for biology
- Neuroimaging

Visit <https://www.duke-nus.edu.sg/ccb> for more details.



## Biostatistics and Health Data Science

Biostatistics and the advancement of medicines are interlinked. Developing state-of-the-art biostatistical methods is essential to analyse arrays of laboratory, measurement methods and data sources, and innovative study designs. Students will complete a 6-months research internship in their second year and receive hands-on professional experience as a biostatistician.

### EMBEDDED IN THE CENTRE FOR QUANTITATIVE MEDICINE

Examples of Research Areas:

- Adaptive clinical trial designs and dynamic treatment regimes
- Analysis of high-dimensional data
- Analysis of time-to-event and censored biomedical data
- Artificial intelligence and machine learning (applications in healthcare)
- Diagnostic medicine and measurement methods

Visit <https://www.duke-nus.edu.sg/cqm> for more details.





# A Nurturing and Engaging Campus Life

Our students enjoy a wide range of activities, resources and support. These enhance their academic experience and create a vibrant sense of community.

## Career Development Programme (CDeP)

The CDeP for PhD students helps them develop essential competencies and transferable skills that translate to higher career success.

### Seminars



- Career paths for scientists
- Mentorship and guidances
- Insights and discussions
- Networking and collaborations

### Workshops



- Resume writing
- Networking skills
- Effective interviewing
- Negotiation skills

### One-on-One



- Resume and cover letter review
- Career development plans
- Career coaching
- Well-being support



### SUSTAINING STUDENTS' GROWTH THROUGH RESEARCH



- Weekly seminars by local and international faculty researchers throughout the year
- Annual Student Research Symposium enabling students to present their research to renowned researchers
- Funding available for students to attend major overseas conferences in their research field

### OUR EXCHANGE PROGRAMME



- Month-long research exchange programme with Duke University
- Offers a different research environment from their “home-lab”
- Broadens students’ research training and expands professional networks

### STUDENT ACTIVITIES



- Many social gatherings and team-building activities available to foster our community
- Activity clubs empower students to channel their energy and pursue their passion





# Financial Support

Students admitted to Duke-NUS' PhD (IBM/QBM) programme will receive the following:

- A scholarship covering 100% of tuition and miscellaneous fees payable; and
- A monthly stipend for the duration of the PhD programme,

Students admitted to the PhD (CTS) programme at Duke-NUS will need to pay annual tuition fees along with Miscellaneous Student Fees.

Meanwhile, Duke-NUS offers scholarships to MD-PhD students that cover their tuition fees for their first two years in the MD programme and their final year in the MD programme.

There is no service commitment for PhD graduates.

## PhD Application Process

**1 JUNE**

Start of  
Application

**15 JANUARY**

Application  
Deadline

**FEBRUARY  
OR MARCH**

Applicant Day

**AUGUST**

Class  
Commencement





# Admissions Application

## Applicant Day

Shortlisted applicants will be invited to attend Applicant Day through an email invitation containing information about the day's programme one to two weeks in advance.

Applicant Day is an excellent opportunity for applicants to meet faculty and students; they

can learn more about Duke-NUS and determine if the school is a good fit.

The day will begin with a welcome address and introductory talk. Following are one-to-one interviews with our research faculty and talks by our PhD students and graduates.

## Pre-requisites

### PhD in Integrated Biology and Medicine

- Bachelor's degree in any discipline
- Graduate Record Examination (GRE) test results\*
- Research experience is looked upon favourably

### PhD in Quantitative Biology and Medicine

- Graduate Record Examination (GRE) Test results
- For Biostatistics and Health Data Science concentration: a Master's degree or a Bachelor's degree in a quantitative discipline
- For Computational Biology concentration: a Bachelor's degree in a biological, computational or quantitative discipline

*\* The GRE is not required for Bachelor degree holders or final-year undergraduates from National University of Singapore (NUS), National Technological University (NTU), Singapore Management University (SMU) and Singapore University of Technology and Design (SUTD) in relevant disciplines.*

## How To Apply

Classes begin in August each year for both PhD programmes. Applications to the PhD programmes open in June of the preceding year and the application deadline is 15 January.

To apply, candidates must submit the following:

- An online application at <https://admissions.duke-nus.edu.sg/apply/>

- At least three recommendation letters
- Official transcripts from Bachelor's (and higher, if applicable) degree programme(s)

Visit <http://www.duke-nus.edu.sg/admissions> for more details on the application process.



## Stay Connected



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[www.duke-nus.edu.sg](http://www.duke-nus.edu.sg)



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[www.youtube.com/user/InsideDukeNUS](https://www.youtube.com/user/InsideDukeNUS)



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Duke University is accredited by the Southern Association of Colleges and Schools Commission on Colleges to award undergraduate and graduate degrees. Duke-NUS is not accredited by the Commission on Colleges and the accreditation of Duke University does not extend to or include Duke-NUS or its students.



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