

INNOVATION AND ENTREPRENEURSHIP

Apart from educating individuals to be outstanding clinicians and clinician researchers, Duke-NUS also aims to develop outstanding healthcare innovators who positively impact and transform the faces of care. To nurture these innovators and foster an innovation ecosystem, Duke-NUS has established the Office of Innovation and Entrepreneurship overseeing the Centre for Technology & Development (CTeD). The Centre manages intellectual property (IP) generated by Duke-NUS faculty, working to ensure optimal commercial outcomes for Duke-NUS inventions.



CTeD

Centre for Technology and Development

CTeD aims to nurture, develop and commercialise Duke-NUS IP in an "Active Translation Model" to facilitate translation of Duke-NUS innovations into commercial application; and to train biomedical scientists in technology development.

To this end, the Centre connects organisations, technologies and people to facilitate relationship development between all of Duke-NUS' stakeholders. CTeD provides enterprise support through IP strategy development, lab-based validation, project management, market analysis, team building, project review and brainstorming.



Successful start-ups from CTeD include

- CognaLearn Pvt. Ltd.
- Vanteres Pvt. Ltd. (formerly Babynostics)
- Enleofen Bio, Pvt. Ltd.
- Trevecta Pvt. Ltd.

Partner organisations include

- A*STAR ETPL
- Duke Fuqua School of Business
- Duke Innovation & Entrepreneurship
- Duke Office of Licensing & Ventures
- National Health Innovation Centre
- NTUitive
- NUS Industry Liaison Office
- SingHealth Office of Intellectual Property
- Singapore-MIT Alliance for Research and Technology
- Singapore Eye Research Institute

DUKE-NUS AT A GLANCE



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ABOUT DUKE-NUS

TRANSFORMING MEDICINE, IMPROVING LIVES

Established in 2005, Duke-NUS Medical School (Duke-NUS) offers robust graduate-entry medical education that is positioned to meet the changing medical landscape and the future healthcare needs of Singapore.

Duke-NUS has pioneered a medical training programme based on Duke University School of Medicine's curriculum. As a research-centric medical school, Duke-NUS boasts scientists at the forefront of their fields, and leading research capabilities. Our students, learning alongside these scientists, are well poised to ask critical questions and explore theories that can impact the way diseases are identified and treated.

Duke-NUS adopts a multi-faceted and multi-disciplinary approach, leveraging on state-of-the-art technology platforms that are opening up new horizons for research. The five cutting-edge signature research programmes that span basic, translational and clinical research in cancer, cardiovascular and metabolic disorders, emerging infectious diseases, health services and neuroscience aim to make a substantive impact on Singapore's biomedical sciences scene, with each extending from fundamental or discovery science into the translational and clinical realm.

Together with Singapore Health Services (SingHealth) as our strategic partner in Academic Medicine, Duke-NUS is poised to transform medicine with its integrated expertise in clinical care, education and research that are focused on transforming medicine and improving patients' lives.





EDUCATION

Duke-NUS offers programmes that lead to a Doctor of Medicine (MD) degree, an MD/PhD degree, a PhD degree in Integrated Biology and Medicine, a PhD in Biostatistics and Bioinformatics, and a PhD in Clinical Sciences.

Medical students enter with at least a baccalaureate degree in any field except medicine, and are conferred a joint MD degree from Duke University and the National University of Singapore (NUS) when they graduate.

Our education model is based on that at Duke University's renowned School of Medicine. Our integrated approach combines academic learning, clinical experience, and clinical and translational sciences research. Key distinguishing features:

- Students cover basic sciences in their first year
- They begin learning basic clinical skills in their first year and enter core clerkships in Year 2 and advanced clinical training during Years 3 and 4
- Students have dedicated time for independent scholarship and research

Annual Students' Fees (AY 2019/2020)

	Singapore Citizens	S\$47,050 (GST subsidy provided)
	Singapore Permanent Residents	S\$54,600 (GST subsidy provided)
	International Students	S\$67,000 (inclusive of GST)

(Updated: March 2019)

Scholarships and bursaries are available for a majority of students to help defray the costs of training. In addition, there is a four-year service obligation for local students and five-year service obligation for international students.



Our Students

Successful student applicants typically have entrance Medical College Admissions Test (MCAT) scores of over 511 and GPAs over 3.6.

60% of matriculates are from Singapore and 40% are from more than 20 countries and from many of the top universities around the world.

Student Performance

Graduates have gone on to obtain competitive residency spots, published more than 300 journal articles as students, and have assumed roles as Chief Resident.



A Duke-NUS innovation that shapes the future of medical education

Learn	Students do self-directed learning and review core content before they come to class.
Engage	Students work in teams to engage in problem-solving, for an active learning environment.
Apply	With core concepts covered, students apply their knowledge to solve practical applications of the core content.
Develop	Students develop critical and creative thinking skills which enable them to be future leaders who will improve the practice of medicine.

TeamLEAD, our innovative approach to education, has garnered wide-spread attention and is now adopted in several schools in Singapore. We are currently training teachers directly and indirectly using this methodology.



RESEARCH

Duke-NUS has established five world-class Signature Research Programmes (SRPs) that are aimed at making a substantive impact on Singapore's biomedical sciences scene, with each extending from fundamental or discovery science into the translational/clinical realm. The areas have been chosen due to their relevance to major health burdens of Singapore and the region. We believe there is a competitive advantage for conducting such research in Singapore, with the programmes capitalising on the strengths of Duke University.

Duke-NUS adopts a multi-faceted, and multi-disciplinary approach, leveraging on state-of-the-art technology platforms that are opening up new horizons for research. A number of significant research discoveries have been produced on these platforms.

Four of our SRPs are laboratory-based:

- **Cancer and Stem Cell Biology (CSCB)**
- **Cardiovascular and Metabolic Disorders (CVMD)**
- **Emerging Infectious Diseases (EID)**
- **Neuroscience and Behavioural Disorders (NBD)**

A fifth, **Health Services and Systems Research (HSSR)**, is more oriented towards public health policy with an emphasis on health economics, decisions sciences and disease prevalence/health burden modelling.

Under the SingHealth Duke-NUS Academic Medicine partnership, Duke-NUS also undertakes clinical research at affiliated hospitals, clinics and specific research sites. It also supports clinical research by providing senior disease experts and senior quantitative experts as part of mentoring teams. The affiliated Singapore Clinical Research Institute also provides full scientific collaboration and guidance in protocol design, execution analysis and publication for investigators.

Our Centres

The **Centre for Ageing, Research and Education (CARE)** is an academic research centre that adopts a multidisciplinary perspective towards ageing research. Its mission is to provide translatable research evidence to support population ageing initiatives in Singapore and the region. CARE also spearheads educational programmes to build competencies on ageing amongst researchers, policymakers and programme professionals.

The **Centre for Computational Biology (CCB)** provides expertise in computational biology and bioinformatics. CCB investigators are especially adept at integrated analyses for -omics studies and systems biology approaches.

The **Centre for Clinician Scientist Development (CCSD)** coordinates mentoring efforts, provides personalised career guidance, and organises structured training to nurture budding clinician scientists in improving their research and leadership skills.

The **Centre for Cognitive Neuroscience (CCN)** is one of Duke-NUS' pioneer labs, that has evolved into an entity, comprised of several faculties engaged in multidisciplinary research into the neural underpinnings of human behaviour.

Our Research Collaborations

Faculty members actively collaborate with academic and healthcare institutions, government organisations, and pharmaceutical and biotechnology companies, both locally and internationally.

We have major research collaborations with:

- A*STAR
- DSO National Laboratories
- Duke University
- GlaxoSmithKline
- Janssen
- Ministry of Health
- National University of Singapore
- SingHealth Group
- Visterra



Three PhD programmes are available: (1) Integrated Biology and Medicine; (2) Biostatistics and Bioinformatics; and (3) Clinical Sciences.

The **Centre of Regulatory Excellence (CoRE)** aims to support the fast growing biomedical industry in the Asia-Pacific region, through the promotion of regulatory leadership, policy innovation in science and scientific excellence.

The **Centre for Quantitative Medicine (CQM)** is an academic home made up of quantitative scientists in the medical field. It serves as a point of contact for biomedical researchers from Duke-NUS partners requiring quantitative expertise.

The **Centre for Technology & Development (CTeD)** facilitates translation of research arising from the activities of Duke-NUS, and its partners into commercial application. Its overarching goal is to establish sustainable, long-term relationships with external private and public partners to provide long-term value to Singapore's biomedical research ecosystem.

The **Lien Centre for Palliative Care (LCPC)** is the first of its kind in Asia. Its goal is to build a strong pool of palliative healthcare professionals to enhance service delivery through innovative training programmes and research.



ACADEMIC MEDICINE



Duke-NUS and SingHealth have established a partnership in Academic Medicine (AM). The SingHealth Duke-NUS Academic Medical Centre (AMC) harnesses the collective strengths of Duke-NUS' medical education and research capabilities, and SingHealth's clinical expertise. Through this, clinical care, education and research are integrated, leading to improved healthcare and patient outcomes.

The SingHealth Duke-NUS AMC work in tandem with students and staff to nurture a vibrant environment that encourages new discoveries in healthcare. The key to the partnership's success is the integration of cutting-edge clinical and translational research and patient care. This collaborative model builds on similar successful concepts applied in academic medical centres across the world.

Academic Clinical Programmes

The Academic Clinical Programme (ACP) is an integrated framework designed to support our vision towards AM. Fifteen ACPs are created for each clinical specialty, harnessing the expertise of each discipline across SingHealth and Duke-NUS for greater synergy in clinical care, education and research.

- **Anaesthesiology and Perioperative Sciences**
- **Cardiovascular Sciences**
- **Emergency Medicine**
- **Family Medicine**
- **Medicine**
- **Musculoskeletal Sciences**
- **Neuroscience**
- **Obstetrics and Gynaecology**
- **Oncology**
- **Ophthalmology and Visual Sciences**
- **Oral Health**
- **Paediatrics**
- **Pathology**
- **Radiological Sciences**
- **Surgery**

SingHealth Duke-NUS Joint Institutes & Centres

The SingHealth Duke-NUS AMC is further enhanced with the establishment of Joint Institutes and Centres.

- **Academic Medicine Education Institute (AM•EI)**
- **Academic Medicine Research Institute (AMRI)**
- **Health Services Research Institute (HSRI)**
- **Infectious Diseases Research Institute (IDRI)**
- **Institute for Patient Safety & Quality (IPSQ)**
- **Institute of Precision Medicine (PRISM)**
- **Joint Centre for Technology and Development (Joint-CTeD)**
- **National Cancer Research Institute Singapore (NCRIS)**
- **National Heart Research Institute Singapore (NHRIS)**
- **National Neuroscience Research Institute Singapore (NNRIS)**
- **Viral Research and Experimental Medicine Centre @ SingHealth Duke-NUS (ViREMICS)**
- **Translational Immunology Institute (TII)**
- **SingHealth Duke-NUS Global Health Institute (SDGHI)**

To be launched in Sept 2018

SingHealth Duke-NUS Disease Centres

The SingHealth Duke-NUS Disease Centres (SDDCs) focus on disease-based outcomes that will benefit from multi-disciplinary coordination for training, research and clinical service. SDDCs enable patients to receive holistic care from a broader base of healthcare professionals without the need to travel to multiple institutions. The integrated care will be enhanced further through deeper and targeted research and education collaborations.

- **SingHealth Duke-NUS Blood Cancer Centre**
- **SingHealth Duke-NUS Breast Centre**
- **SingHealth Duke-NUS Diabetes Centre**
- **SingHealth Duke-NUS Head and Neck Centre**
- **SingHealth Duke-NUS Liver Transplant Centre**
- **SingHealth Duke-NUS Lung Centre**
- **SingHealth Duke-NUS Sleep Centre**
- **SingHealth Duke-NUS Sports & Exercise Medicine Centre**