



TRANSFORMING MEDICINE



AT THE INTERSECTIONS



CORPORATE BROCHURE



## A LANDMARK COLLABORATION

### BETWEEN TWO WORLD-RANKING UNIVERSITIES

Duke-NUS Medical School is Singapore's first and only US-style graduate medical school. Established as a landmark collaboration between Duke University and the National University of Singapore (NUS), we offer holistic medical education against the backdrop of extensive medical research that is integrated with the largest public healthcare cluster, the Singapore Health Services (SingHealth).

Our curriculum takes reference from the Duke University School of Medicine in the United States and adapts it to suit the needs of Singapore and the region.

Our partnership with SingHealth fosters collaborations in clinical research, furthering discoveries and creating solutions for Asian healthcare challenges, placing Duke-NUS firmly at the centre of Singapore's healthcare ecosystem.



## VISION

# Transforming Medicine, Improving Lives

Greater things happen when we embrace diversity and invite different views of medicine. At Duke-NUS, we build on our capabilities in education and research to challenge the status quo and create new possibilities in innovation and clinical care that impact Singapore and beyond.

Relationship manager in the banking and insurance industry keen to improve healthcare affordability

Cellular and physiological sciences major with an interest in patient advocacy

Neuroscientist with a passion for adventure sports





**EDUCATION GOAL**

To nurture clinical innovators  
and translate discoveries  
into better health

Biologist looking to  
incorporate technology  
into patient care

Engineer with an  
interest in palliative  
medicine

## LEADING CHANGE

### Senior Management

**Prof Thomas M Coffman**

Dean

**Prof Patrick J Casey**

Senior Vice Dean,  
Office of Research

**Ms Karen Chang**

Senior Vice Dean  
and Group Director,  
Office of Corporate Services

**Prof Ian Edward Curran**

Vice Dean,  
Office of Education

**Clin Assoc Prof Chow  
Wan Cheng**

Vice Dean,  
Office of Academic and  
Clinical Development

### Governing Board

The management is guided by the governing board, which comprises members from the ministries, local and global conglomerates as well as leaders from NUS and Duke.

### Message from our Dean

Duke-NUS Medical School was established in 2005 to transform the medical landscape in Singapore as a research-intensive, graduate-entry medical school with a special mission of producing clinician-scientists. Since then, our School has earned its reputation as a disruptive force in the biomedical landscape.

We've spearheaded cutting-edge, impactful research through our Signature Research Programmes and produced outstanding clinicians with the skills to face our evolving healthcare challenges. Beyond that, we aspire to nurture 'Clinician Plus'—capable clinicians who can become leaders, innovators, educators, scholars and scientists. This is possible through our innovative education programme that emphasises critical thinking skills and solid clinical training provided through our strategic partnership with SingHealth, Singapore's largest public healthcare cluster. Our SingHealth Duke-NUS Academic Medical Centre provides a rich, multidisciplinary ecosystem that combines research, education and patient care to translate into better healthcare outcomes. We hope that you will be inspired to join us in our journey of transforming medicine and improving lives.

**PROF THOMAS M COFFMAN**

# MILESTONES

Apr 2003



Duke University and NUS sign a Memorandum of Understanding to establish Singapore's first graduate medical school.

Aug 2005

Prof Robert S Williams, MD, Dean of the Duke University School of Medicine, is officially named the Founding Dean of Duke-NUS.

2006

Four Signature Research Programmes are set up to address identified major health burdens in Singapore and the region.

May 2007

Duke-NUS receives its first gift of S\$80 million from the estate of Tan Sri Khoo Teck Puat.

Aug 2007



Twenty-six students are enrolled into Duke-NUS' inaugural MD programme.

Sep 2009

Singapore's Prime Minister Lee Hsien Loong officially opens the new campus at 8 College Road.



Aug 2010

The inaugural PhD programme in Integrated Biology and Medicine commences with 12 students.

Nov 2010

Duke University and NUS sign the second phase of their partnership collaboration.

May 2014



Duke-NUS and SingHealth sign a Memorandum of Understanding for the SingHealth Duke-NUS Academic Medical Centre.

Jun 2016

Duke University and NUS sign the third phase of their partnership collaboration.



Aug 2017

The PhD programme in Quantitative Biology and Medicine welcomes its first intake of students.

Aug 2018

The PhD programme in Clinical Sciences welcomes its first intake of students.

Jan 2020



The Duke-NUS facilitated start-up, Enleofen Bio, seals Singapore's largest ever biotech deal with pharmaceutical giant Boehringer Ingelheim.

Apr 2020

Duke-NUS celebrates its 15<sup>th</sup> anniversary.

Nov 2020

cPass™—a blood test co-developed by Duke-NUS that can be used in hospitals and clinics to specifically detect neutralising antibodies from past COVID-19 infections or vaccination—becomes the first in the world to receive emergency use authorisation from the US Food and Drug Administration.



Follow the QR code for more information on Duke-NUS' latest news





# A DUKE-NUS

# EDUCATION

Since the very beginning, we've held a firm belief that Singapore needs a new breed of clinicians and researchers who can not only improve the delivery of care but also solve some of the most pressing problems faced by our healthcare system today. We welcome students from varied academic and personal backgrounds and nurture this diversity to give our students the opportunity to transform medicine and improve lives.

**PROF IAN EDWARD CURRAN**

VICE DEAN, OFFICE OF EDUCATION





The future of medicine will need to go beyond treating diseases; it will look at reimagining healthcare as a system and in the community.

This will require the creativity and courage to confront challenges from different angles and shift paradigms to create future solutions. In addition to rigorous training and access to world-class clinicians and faculty, our students are exposed to a diversity of perspectives and purposeful discussions around key issues in medicine and healthcare.

As Singapore's healthcare system continues to grow and develop, a new generation of clinicians and researchers is needed to uncover new approaches to prevent disease and deliver care. In this way, we are able to overcome the healthcare challenges of today and tomorrow.

**HOLISTIC**

**CURRICULUM**

Our students are exposed to rigorous training, which will ensure that as graduates they are ready to face the healthcare challenges of tomorrow. This ethos cuts across both our Doctor of Medicine (MD) and Doctor of Philosophy (PhD) programmes.

### **Four-year MD Programme**

We provide comprehensive medical education, with theoretical knowledge in Year One that is complemented by early clinical experience in SingHealth hospitals and extensive research projects from Year Two onwards. A research project is also allocated in Year Three based on each student's choice to equip them with the skills to apply an evidence-based approach to their practice of medicine.

Our MD curriculum is underpinned by TeamLEAD (Learn, Engage, Apply and Develop), which is our innovative 'flipped classroom' approach that promotes dynamic discussion and self-directed learning that keeps students engaged in learning far beyond their educational years.

Upon the completion of the programme, students are each awarded a joint MD degree by Duke University and NUS.

### **Combined MD-PhD and PhD Programmes**

Our PhD programme immerses students in our world-class Signature Research Programmes and Research Centres to conduct cutting-edge research.

Upon the completion of the programme, students are each awarded a joint PhD degree by Duke University and NUS.

Additionally, we are one of the few medical schools to offer a combined MD-PhD track for students who wish to become clinician-scientists.

### **PhD Programmes:**

- Clinical Sciences
- Integrated Biology and Medicine
- Quantitative Biology and Medicine



Our students benefit from exposure to early clinical experiences at SingHealth hospitals.

# CONDITIONAL ADMISSIONS

## PATHWAYS

The Conditional Admissions Pathway is intended to encourage talented and committed students who have achieved academic distinction in high school (A levels, IB or diploma) and who have a second passion on top of medicine to gain a conditional early acceptance<sup>1</sup> to the MD programme in Duke-NUS Medical School (Duke-NUS) while they pursue an undergraduate degree in a partner university prior to the MD programme.

<sup>1</sup>Students on this pathway will formally be admitted into the MD programme after they have successfully completed their undergraduate degree and have met all conditions set by both their undergraduate institution and Duke-NUS Medical School.



Duke  
UNIVERSITY

Duke & Duke-NUS  
Special Pathway



KING'S  
*College*  
LONDON

King's College-Duke-NUS Academic  
Clinician Pathway



NUS | Engineering  
National University  
of Singapore

NUS Engineering & Medicine Track



NANYANG  
TECHNOLOGICAL  
UNIVERSITY  
SINGAPORE

NTU-Duke-NUS Medicine Pathway



SMU  
SINGAPORE MANAGEMENT  
UNIVERSITY

SMU-Duke-NUS Medicine Pathway



SUTD  
SINGAPORE UNIVERSITY OF  
TECHNOLOGY AND DESIGN

SUTD-Duke-NUS Special Track



昆山杜克大学  
DUKE KUNSHAN  
UNIVERSITY

Duke-Kunshan-Duke-NUS  
Medicine Pathway

# APPLICATION

## TIMELINE

### MD & MD-PhD Timeline

<b>Jun</b>	Application open
<b>Sep</b>	Early application deadline: 1 Sep interviews begin. Interviewed applicants apply for financial aid
<b>Nov</b>	Admissions offers are made from Nov
<b>Dec</b>	Financial aid offers are made from Dec
<b>Jan</b>	Final application deadline: 31 Jan
<b>Jul</b>	Class confirmed by Jul

### PhD Timeline

<b>Jun</b>	Applications open
<b>Jan</b>	Final application deadline: 15 Jan
<b>Feb</b>	Interviews begin
<b>Jul</b>	Class confirmed by Jul

### CA Timeline

<b>Feb</b>	Regular applications open
<b>Mid-Mar</b>	Application deadline for NTU, NUS, SMU, SUTD and Yale-NUS
<b>1st week of Apr</b>	Application deadline for Duke and KCL
<b>End Mar to Mid-Apr</b>	Interviews begin
<b>Mid-Apr to May</b>	Admission offers are made
<b>May</b>	Acceptance period
<b>Mid-May</b>	Inform undergraduate schools about the confirmed list of accepted students

## OUR FACULTY

Students benefit from the direct guidance of SingHealth clinicians during their education. Our faculty, with more than 1,500 full-time and adjunct staff, are from renowned local and global institutions and are involved across the spectrum of research, patient care and education.



**Prof Lim Soon Thy**

**Senior Associate Dean, MD Programme, Duke-NUS Medical School**  
Academic Vice Chair of Clinical Services, SingHealth Duke-NUS Oncology Academic Clinical Programme  
Deputy Medical Director (Clinical), National Cancer Centre Singapore

Prof Lim also heads the SingHealth Duke-NUS Blood Cancer Centre and plays an active role in various medical societies and patient organisations. Heavily involved in research, his team leads the blood cancer (T cell lymphoma) genomics project at the International Cancer Genomics Consortium.



**Clin Prof Chan Choong Meng**

**Senior Associate Dean, Duke-NUS Medical School**  
Group Chief Education Officer, SingHealth  
Co-Director, SingHealth Duke-NUS Academic Medicine Education Institute (AM•EI)

As co-director for AM•EI, Clin Prof Chan is focused on improving training standards and learning experiences for our key stakeholders, residents, consultants and students. Within this, he ensures educational, clinical and research excellence.



**Asst Prof Sonali Ganguly**

**Senior Consultant, Department of Endocrinology**  
Director, Obesity Metabolic Unit, Singapore General Hospital (SGH)  
Assistant Professor, SingHealth Duke-NUS Medicine Academic Clinical Programme, Duke-NUS Medical School

Asst Prof Ganguly is double-board certified in Internal Medicine and Endocrinology, Diabetes, and Metabolism by the American Board of Internal Medicine. She is director of the Obesity and Metabolic Unit at SGH, a unique offering by SGH that adopts a multidisciplinary team approach to help patients manage their lives in the long term.



**Assoc Prof Ong Biauwh Chi**

**Senior Consultant, Anaesthesiology**  
Chairman Medical Board, Sengkang General Hospital  
Associate Professor, SingHealth Duke-NUS Anaesthesiology & Perioperative Sciences Academic Clinical Programme, Duke-NUS Medical School

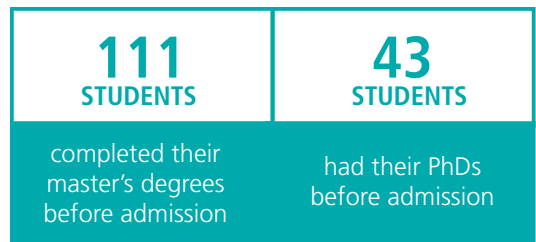
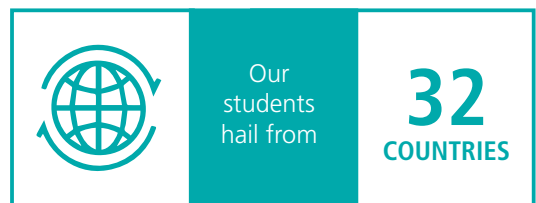
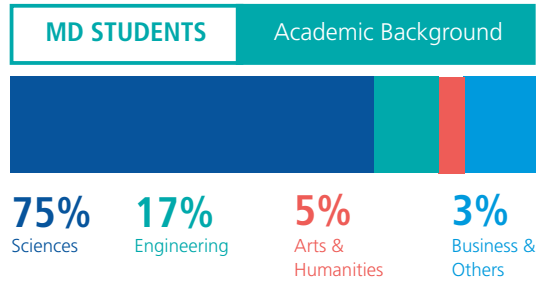
Assoc Prof Ong is interested in teaching, mentoring and training of junior doctors and leverages simulations and various pedagogy methods. She is also the Chair of the Examination committee overseeing the Master of Medicine Examinations in Anaesthesia.

# DIVERSITY IN OUR

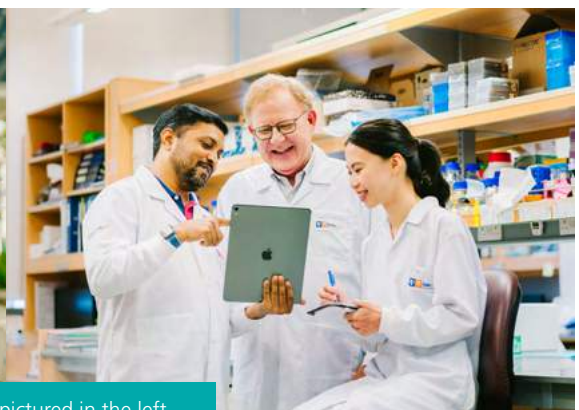
## STUDENT BODY

Our students are of various academic backgrounds from top universities around the world, such as Johns Hopkins University, Massachusetts Institute of Technology, Stanford University, University of Oxford, Peking University and Tsinghua University. While some join us after years in the workforce, we have also established several pre-medical pathways with well-known universities in Singapore and the United States. Students embarking on this pathway will have the opportunity to pursue diverse academic interests while remaining engaged with the medical landscape during their undergraduate studies.

This diversity in experience, knowledge and expertise forms a wealth of perspectives that contribute to a dynamic environment where ideas can incubate and grow and where students can choose their own path in medicine and research to make a difference. Students are also encouraged to work with the faculty to reframe some of today's most pressing healthcare challenges and create new solutions.



Figures are updated as of Jan 2023



Our distinguished faculty, such as Prof London Lucien Ooi (pictured in the left image) and Prof Patrick Casey (pictured in the right image) enrich our students' educational experiences across clinical and research skills.

## OUR STUDENTS



**Mr Dinesh Selvan**

MD Programme, Class of 2024

Upon completing his undergraduate studies in Engineering, Mr Selvan interned at a biomedical technology company where he helped engineer a cancer diagnostic device. The experience sparked his interest in medicine and inspired him to uncover new ways to incorporate engineering in medicine that can make a difference in patients' lives.



**Ms Hoe Pei Shan**

MD Programme, Class of 2023

As a former investigative journalist and volunteer with the Singapore Red Cross, Ms Hoe had travelled to disaster-hit places to report on international aid missions and witnessed first-hand the impact that healthcare professionals can make. Coupled with her experience as a national gymnast, Ms Hoe hopes to contribute to both sports and disaster medicine.



**Dr Tan Hong Chang**

Clinical Sciences PhD Programme,  
Intake Year 2019

Dr Tan is a Senior Consultant under the Department of Endocrinology at the Singapore General Hospital and the director of research at the SingHealth Duke-NUS Diabetes Centre. He is completing his PhD at the School to further develop his translational research skills as a clinician-scientist to address the unmet clinical needs in the management of metabolic disorders.



**Ms Sonia Chothani**

Integrated Biology and Medicine PhD  
Programme, Intake Year 2016

Prior to her admission, Ms Chothani worked at Philips Research and A\*STAR. She is completing her PhD under the Cardiovascular and Metabolic Disorders programme and has co-authored nine publications in top journals including Nature and Circulation. She was awarded a scholarship for her work through the National Institute of Diabetes and Digestive and Kidney Diseases.

## CLINICIANS FIRST

## CLINICIANS PLUS

We believe that doctors should be competent clinicians first and, beyond that, build on their diverse backgrounds and knowledge to uncover new ways in which they can make a difference to the practice of medicine. Be it as scientists, entrepreneurs, innovators, educators, policymakers and leaders in healthcare, we encourage exploration and the discovery of greater things in our healthcare landscape and beyond.



### Clinician + Educator

#### Dr Charmain Heah, Class of 2013

Dr Heah initially pursued a career in Molecular and Cell Biology at the Sir William Dunn School of Pathology. She eventually enrolled in Duke-NUS and is currently with the Department of Emergency Medicine at Tan Tock Seng Hospital. She has been involved in public education forums, speaking on relevant topics, and is a College Master at Duke-NUS where she provides support to students in both academics and other challenges that they face.



### Clinician + Innovator

#### Dr Rena Dharmawan, Class of 2011

With three start-ups under her belt, Dr Dharmawan has been a trailblazer in illustrating how new innovations can be scaled to bring about widespread impact. For example, one of her start-ups, Jagga-Me, is an online platform that matches home-nursing care to families in need. With a background in biomedical engineering, she is also a Singapore-Stanford Biodesign fellow and is with the Head and Neck Surgical division at the National Cancer Centre Singapore.





### Clinician + Leader

#### Dr Lim Kheng Soon, Class of 2011

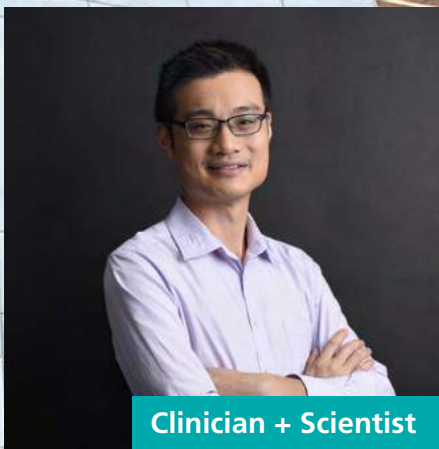
Dr Lim spent several years in the air force as an aircraft engineer after he obtained his degree in mechanical engineering. Since graduating, he has completed his specialist training with the SingHealth Diagnostic Radiology Residency Programme and was appointed Chief Resident, and won the SingHealth Publish! Award (Outstanding) for his research publications. He is also the director of clinical operations in his department at Singapore General Hospital.



### Clinician + Scientist

#### Dr Feng Jia Jun, Class of 2012

Prior to admission to Duke-NUS, Dr Feng was a molecular biologist but wanted to see a more direct and practical impact on patients from his research. Coupling his research expertise with his medical knowledge, he developed an artificial tissue to cover the wounds of surgical patients to speed up their recoveries. He is now a resident in the Plastic, Reconstructive and Aesthetic Surgery programme at SingHealth and has won the inaugural National Outstanding Clinician-Scientist Resident Award.



### Clinician + Scientist

#### Dr Hiu Yeung Lau, MD-PhD, Class of 2018

Dr Hiu began his career as a research officer in A\*STAR after obtaining his undergraduate degree in Molecular and Cell Biology from Johns Hopkins University. He enrolled in the combined MD-PhD programme at Duke-NUS where he honed his research skills and coupled this with extensive medical knowledge. Since graduating, he has embarked on his residency training with SingHealth Pathology and continues his research in cancer biology.



**RESEARCH IN SINGAPORE**

**FOR ASIA AND THE WORLD**

Our faculty and researchers collaborate with academic and healthcare institutions, government organisations and pharmaceutical and biotechnology companies, both locally and internationally. Significant research discoveries have been made at Duke-NUS, and many of our researchers have been bestowed with accolades and awards from across the globe.

**PROF PATRICK J CASEY**

**SENIOR VICE DEAN, OFFICE OF RESEARCH**



Research lays the foundation and informs all that we do. Our faculty and students are involved in a wide range of research, covering basic scientific discovery to translational research that take our findings from bench to bedside and back again. In doing so, we continually look at how we can shape medicine for the better.

Based in Singapore, Duke-NUS is poised to leverage its global ecosystem of medicine to tackle diseases in the context of Asia, be it the genetic make-up and behavioural trends of Asian populations or in relation to the healthcare models of the region.

This stems from our multidisciplinary approach to health sciences and research and our strong ties with Duke University, NUS and growing network of partners in Asia.

Our research areas are focused on addressing identified major health burdens in Singapore and the region. These include diseases that are lesser known in the West, such as infectious diseases like dengue and severe acute respiratory syndrome (SARS), as well as several specific cancers.

# WORLD-CLASS RESEARCH

# IN SINGAPORE

Since its inception, Duke-NUS has built a reputation for driving high-quality research that makes a difference to the scientific and medical communities as well as patients in Asia.

Our five Signature Research Programmes (SRPs) form the core research areas of the School and map to the major areas of health challenges in Singapore. Our Research Centres support and provide the expertise required to build a comprehensive ecosystem for research in Duke-NUS and with other institutions.

Our faculty and students have published papers in internationally distinguished journals and won prestigious awards for their research. This includes international awards such as the American Association for Cancer Research (AACR) Team Science Award, with the members of the team from Duke-NUS being the first Asian team to be awarded for their impact on cancer research.

## SIGNATURE RESEARCH PROGRAMMES

- Cancer and Stem Cell Biology
- Cardiovascular and Metabolic Disorders
- Emerging Infectious Diseases
- Health Services and Systems Research
- Neuroscience and Behavioural Disorders

## OUR RESEARCH BY THE NUMBERS

OVER  
**11,000**

papers published in international peer-reviewed journals



**11**

Singapore Translational Research (Star) Investigator Awards



MORE THAN  
**\$772**  
MILLION

in research funding locally and overseas

MORE THAN  
**300**

Synergistic Research Alliances

Figures are updated as of Jan 2023

## RESEARCH CENTRES

- Centre for Ageing Research and Education
- Centre for Clinician-Scientist Development
- Centre for Computational Biology
- Centre for Outbreak Preparedness
- Centre for Quantitative Medicine
- Centre of Regulatory Excellence
- Centre for Technology and Development
- Centre for Vision Research
- Lien Centre for Palliative Care
- Pre-hospital and Emergency Research Centre



# FIGHTING THE

# GLOBAL PANDEMIC

When the novel coronavirus (COVID-19) first emerged in late 2019, little was known about the virus and how the pandemic would unfold. Leveraging our global network and extensive expertise in infectious diseases, our researchers were able to contribute to the fight against the outbreak in meaningful ways.

### Successful Culture of the Virus

In January 2020, our researchers worked with the SingHealth Duke-NUS Academic Medicine Centre, the Singapore General Hospital, the National Centre for Infectious Diseases and the Ministry of Health to successfully culture the coronavirus, making Singapore the third country in the world to do so. Cultured within a week of Singapore's first case, the virus sample paved the way for more accurate diagnosis and the development of new tools.

### Development of a Rapid Test Kit

In May 2020, our researchers invented the SARS-CoV-2 serology test, cPass™—the first-in-the-world test that rapidly detects COVID-19 antibodies. The test kit, co-developed with GenScript and A\*STAR, was made available to Singapore hospitals and used to evaluate potential vaccines and for contact tracing applications.

### Partnership to Develop a Novel Vaccine

In July 2020, Duke-NUS entered a partnership with the US pharmaceutical company, Arcturus Therapeutics to develop a novel vaccine against COVID-19, leveraging Duke-NUS' technology to rapidly evaluate vaccines for effectiveness and safety.



Prof Wang Linfa from the Duke-NUS Emerging Infectious Diseases programme (pictured centre in the left image and featured in the right image) and his team helped to develop cPass™, a first-in-the-world rapid test to detect COVID-19 antibodies.



RESEARCH THAT

IMPACTS SYSTEMS

Our SRPs and Research Centres partner with relevant experts and institutions across Singapore to drive system-wide impacts and improvements that change the delivery of care and ultimately improve the lives of patients and their families.

### Developing the National Strategy for Palliative Care

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The Lien Centre for Palliative Care at Duke-NUS was commissioned by the Ministry of Health to produce Singapore's first National Strategy for Palliative Care. Working with luminaries in the palliative care community in Singapore, the team developed three broad recommendations that have guided the implementation of palliative care initiatives in Singapore. The recommendations covered areas of service development, training and development, and public education and awareness.

Since its implementation, Singapore has seen improvements in its ranking in the Quality of Death Index, grown its capacity to meet the demand of care and created better awareness of palliative care.

### Improving Gestational Diabetes Mellitus Screening Strategies

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Gestational diabetes mellitus (GDM) poses an increased health risk to pregnant women and their fetuses and affects about 15 percent of pregnant women worldwide, with Asian women found to be at a greater risk.

Working with KK Women's and Children's Hospital, the Health Services and Systems Research programme at Duke-NUS found that routine screening of pregnant women, within 24 to 28 weeks of pregnancy, with an oral glucose tolerance test is the most effective strategy in detecting GDM early. Previously, screening tests targeted only high-risk individuals, and more than 60 percent of pregnant women with mild diabetes were missed. The new strategy was able to improve detection rates and allow for early interventions, which can reduce complication rates and health risks by as much as 40 percent.

### Extending the Continuum of Care Beyond the Hospital for Fall Patients

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Falls are a leading cause of disability and death for the elderly, especially among high-risk individuals recently discharged from the emergency department. The Centre for Ageing Research and Education at Duke-NUS, Changi General Hospital and the Agency for Integrated Care, worked together to evaluate the effectiveness of tailored physical therapy programmes developed to prevent falls among such elderly.

The Steps to Avoid Falls in Elderly study found that while such programmes did not lead to less falls, seniors saw less serious falls and slower physical declines. The study provides strong evidence and support for extended care post discharge from emergency departments, such as connecting with community-based physical therapists, to prevent future emergency department visits due to falls.

# FIGHTING DISEASES

## PREVALENT IN SINGAPORE AND ASIA

### First Made-in-Singapore Cancer Drug

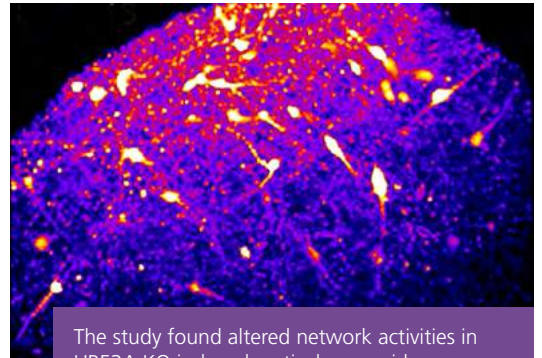
In as early as 2009, the Duke-NUS team made significant discoveries around a group of cell-signalling pathways that are linked to cancer growth. This led to the development of a new drug candidate—the first to be discovered and developed in Singapore—that targets several common Asian cancers. The development of the drug candidate, ETC-159, was a long journey and was the work of the School and A\*STAR. As of 2015, clinical trials on the drug have been conducted in Singapore and the United States.



Prof David Virshup from Duke-NUS (left) and Prof Alex Matter from A\*STAR led the team.

### Creating Brain Models to Understand Seizures

Our researchers and their peers at the National Neuroscience Institute identified a missing gene that leads to frequent epileptic seizures in patients suffering from Angelman syndrome (AS), a neurodevelopmental disorder. Previous studies on the topic used mouse models, which made it difficult to translate findings into human trials. Our team took a novel approach and used stem cell models to study the functional changes of human neurons of those affected by AS at both the cellular and network levels. The findings could lead to the development of potential therapies for epilepsy in AS and provide a new starting point in designing experimental methodology to tackle human brain disorders.



The study found altered network activities in UBE3A KO induced cortical organoids.

### Breakthrough for Tackling Diabetic Kidney Disease

With Singapore ranked among countries in the world with the highest rates of diabetic kidney disease, a deeper understanding of the disease will help to identify potential treatment options. Our researchers led a team to identify a series of genes that control immune and inflammatory responses that may contribute to the progression of kidney damage. The surprising discovery was made in mouse models that were first developed by the team, which could provide further information on diabetic kidney disease in the future. This includes possible treatment options and preventative measures for the disease.

FROM BENCH

TO BEDSIDE

The value and impact of our research is far-reaching, and we are bringing discoveries from the labs and applying them to patient care. Our Centre for Technology and Development works closely with researchers and entrepreneurial players in Singapore, from government agencies to universities and private companies, to translate research outcomes into impactful technologies.

This allows us to further develop discoveries that could potentially make a difference in the lives of patients and commercialise discoveries to achieve scale. In this way, we are able to impact more people in the community and bring about new systems of care for Singapore to make a real difference in the health of Singapore and beyond.

## CREATING NEW SOLUTIONS

>200

invention disclosures submitted for review



MORE THAN

30

licensing agreements executed

>140

patents awarded



20

start-up companies by Duke-NUS investigators

Figures are updated as of Mar 2022





**INNOVATING**

**FOR IMPACT**

## **Widening the Impact of Discoveries in the Blood-Brain Barrier**

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The complexity of the blood-brain barrier has made it difficult for drugs to be delivered to the brain to treat diseases of the brain, eye and central nervous system. Biotech start-up, Travecta, was formed by Prof David Silver, the deputy director from the Cardiovascular and Metabolic Disorders programme at Duke-NUS. The work by the Singapore-based drug discovery company is centred on key findings around a transporter protein in the brain, which could provide a platform for selective drug delivery.

To achieve scale and wide-spread impact, Travecta partners with pharmaceutical companies to apply its platform and ultimately assist them in developing more effective treatments for patients. In 2020, Travecta secured US\$15 million in funding from a venture capital fund. The funding will allow Travecta to grow and advance the development of its non-opioid product that targets pain.

## **A Platform to Develop First-in-Class Treatments**

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Based on a breakthrough discovery, Enleofen Bio, a Singapore-funded biotech start-up, develops novel therapeutics to treat the build-up of deadly scar tissue in organs, including the heart. These are classified as fibrotic diseases, which represent major causes of illness and death globally and have few treatment options.

The biotech platform is based on the discoveries by Prof Stuart Cook and Assoc Prof Sebastian Schafer from Duke-NUS' Cardiovascular and Metabolic Disorders programme around a specific cytokine—a protein important in cell signalling—that can be targeted to prevent and treat fibrotic diseases. In 2020, global pharmaceutical Boehringer Ingelheim entered a partnership with Enleofen Bio to develop preclinical drugs that would help to treat such diseases and represents the largest deal with a Singapore biotech company.

## **A Science-Based Approach to Education to Make Learning Better**

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CognaLearn is a learning-science company that combines digital technology with team-based education and cognitive science to help people learn better and faster. The company leverages a proprietary patent-pending method that was developed at Duke-NUS, which has been shown to improve learning outcomes and engagement. CognaLearn customises and builds education solutions for healthcare companies such as GSK, Pfizer and Takeda.

Since its inception, CognaLearn has worked with over 75 academic, corporate and government institutions from 15 countries on five continents to help educators transform education by replacing lecture-based learning with team-based learning.

A close-up photograph of a male scientist with dark hair, wearing clear safety glasses and a white lab coat. He is looking down intently at a piece of laboratory equipment. The background is a brightly lit laboratory with various pieces of machinery and equipment. The overall color palette is dominated by blues and greens.

**BRINGING EDUCATION,**

**RESEARCH AND CARE TOGETHER**

The SingHealth Duke-NUS AMC has become a superb platform for enhancing our education and translational research programmes, allowing the full expression of our efforts to transform medicine for patients here in Singapore.

**PROF THOMAS M COFFMAN**

**DEAN, DUKE-NUS**



Providing effective and humane care is complex and multifaceted. It requires an ecosystem that promotes curiosity and encourages professionals to constantly discover, innovate and apply evidence-based approaches to their practice, delivery of care and to the interrogation of the policies that govern our systems.

Our strategic partnership with SingHealth under the Academic Medical Centre (AMC) harnesses the collective expertise, experiences and knowledge of both institutions to bring education, research and clinical care together to make a difference to the practice of medicine.

From individual patient care to healthcare systems, the SingHealth Duke-NUS AMC creates a collaborative model and facilitates a vibrant and cohesive environment that encourages innovation and creates impact across the entire spectrum of medicine and healthcare.

Our unique position as a leading AMC in Asia gives us a good understanding of diseases prevalent in the region, enabling us to conduct ground-breaking research to address healthcare challenges that impact populations now and in the future. Our AMC partnership, which brings together SingHealth's clinical expertise and Duke-NUS' research and education capabilities, holds us in good stead to define tomorrow's medicine and improve lives.

**PROF IVY NG**

GROUP CEO, SINGHEALTH

## OUR ACADEMIC MEDICINE CENTRE

### PARTNERSHIP

The education and research endeavours under the AMC are supported by the Academic Clinical Programmes, SingHealth Duke-NUS Joint Institutes and Centres, as well as SingHealth Duke-NUS Disease Centres.

#### Academic Clinical Programmes (ACPs)

Integrated frameworks designed to support our vision towards Academic Medicine are created for 15 clinical specialities, 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
- Neurosciences
- Obstetrics and Gynaecology
- Oncology
- Ophthalmology and Visual Sciences
- Oral Health
- Paediatrics
- Pathology
- Radiological Sciences
- Surgery





## SingHealth Duke-NUS Joint Institutes and Centres

Through Joint Institutes and Centres, we invest in translational and clinical research platforms to deliver world-class scientific discoveries and solutions to prevent and treat diseases prevalent in Asia.

- Academic Medicine Education Institute
- Academic Medicine Innovation Institute
- Academic Medicine Research Institute
- Health Services Research Institute
- Infectious Diseases Research Institute
- Institute for Patient Safety and Quality
- Institute of Precision Medicine
- Joint Centre for Technology and Development
- National Cancer Research Institute Singapore
- National Dental Research Institute Singapore
- National Heart Research Institute Singapore
- National Neuroscience Research Institute Singapore
- SingHealth Duke-NUS Global Health Institute
- SingHealth Duke-NUS Institute of Biodiversity
- Translational Immunology Institute
- Viral Research and Experimental Medicine Centre

## SingHealth Duke-NUS Disease Centres

Our disease centres focus on disease-based outcomes that will benefit from multidisciplinary coordination for training, research and clinical service.

- SingHealth Duke-NUS Blood Cancer Centre
- SingHealth Duke-NUS Breast Centre
- SingHealth Duke-NUS Cell Therapy Centre
- SingHealth Duke-NUS Diabetes Centre
- SingHealth Duke-NUS Genomic Medicine Centre
- SingHealth Duke-NUS Head and Neck Centre
- SingHealth Duke-NUS Lung Centre
- SingHealth Duke-NUS Memory and Cognitive Disorder Centre
- SingHealth Duke-NUS Sleep Centre
- SingHealth Duke-NUS Spine Centre
- SingHealth Duke-NUS Sports and Exercise Medicine Centre
- SingHealth Duke-NUS Supportive and Palliative Care Centre
- SingHealth Duke-NUS Transplant Centre
- SingHealth Duke-NUS Vascular Centre

HELP US MAKE

GREATER THINGS HAPPEN

At Duke-NUS, we are committed to enhancing education, furthering discoveries and making an impact on the community and healthcare system, and to continue to do so, we welcome all to our cause.

We invite you to get involved with Duke-NUS, either as a student, staff, faculty, partner or donor to continue the good work that Duke-NUS does.

To find out how you can support Duke-NUS in shaping the future of medicine, please visit us at [www.duke-nus.edu.sg/giving](http://www.duke-nus.edu.sg/giving).



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# TRANSFORMING MEDICINE, IMPROVING LIVES



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