

The NUS Yong Loo Lin School of Medicine has come far in 120 years. In the first of a two-part series that ends tomorrow, *The Straits Times* takes a look at some of its achievements and where it is headed.

Brought to you by the National University of Singapore Yong Loo Lin School of Medicine.

NUS Medicine turning into a research powerhouse

Its research findings are cited more frequently than others in the medical field

Salma Khalik

Research is a very important facet of working at the NUS Yong Loo Lin School of Medicine, and almost every member of its faculty is involved in scientific or clinical studies.

The school secures more than \$100 million in research grants each year to fund impactful research and breakthroughs that shape the future of healthcare, with the money coming from a variety of sources, including the university, the Government, industry partners and private foundations.

In 2024, NUS Medicine researchers published 3,865 papers, which were cited 21,829 times, and this intense focus on research has borne fruit, both in discovering better ways to treat patients and raising the school's standing in the world, said Professor Roger Foo, vice-dean of research.

There are at least 220 labs in NUS Medicine, each of them helmed by a group leader or principal investigator, distributed among 10 translational research programmes and 15 faculty research centres. All these programmes and centres are led by prominent and world leaders in their research area.

There is also dedicated research administrative staff who support

the school's research mission, through often complex approval processes, sometimes involving collaborations with multiple institutions all at one time. "Without this contingent of professional research administrators, none of us would be able to do the research smoothly," said Prof Foo.

An example of better patient care is the development in 2019 of the world's first molecular blood test for early gastric cancer detection. The team was led by Professor Jimmy So, a senior gastrointestinal surgeon at National University Hospital (NUH) and the National University Cancer Institute; Associate Professor Too Heng-Phon from the department of biochemistry at NUS Medicine; and Professor Yeoh Khay Guan, a former dean and currently a senior consultant at the division of gastroenterology and hepatology at NUH and chief executive at the National University Health System (NUHS).

Gastric, or stomach, cancer is the fifth-most common cancer globally, with Asians being the most prone to it. In Singapore, it is the fourth-most common cause of cancer death in men, and fifth-most in women.

The researchers' discovery led to spin-off company Mixres, which was listed on the Stock Exchange of Hong Kong in May. It closed its first

day of trade as a new biotech unicorn, with a market capitalisation of HK\$8.29 billion (\$\$1.34 billion). The school also uses artificial intelligence to search available data to see where patient care can be improved.

NUS Medicine gained permission in early 2025 to duplicate the National University Health System's (NUHS) Electronic Medical Records. In the CardioSight-Horus platform, records are anonymised so patient identities are not revealed, and researchers from various departments have been able to mine the data to see where the gaps are in patient care.

Within three months, the school had found 2,000 patients in the NUHS cluster with high cholesterol levels who were not being treated for it.

Given the medical ramifications of uncontrolled cholesterol levels, the researchers received the green light to identify and alert the patients. Hotlines were set up so that these patients could seek advice.

There will be follow-ups in the coming months to see if these patients have brought their cholesterol levels to within acceptable limits. If they have, it would prove that by acting on available data, "we can move the needle" in directly improving patient care, said Prof Foo.

With regard to international recognition, Prof Foo said research findings from the school are now frequently cited. He added: "As demonstrated by robust, quantifiable growth in research perfor-

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mance, NUS Medicine's Field-Weighted Citation Impact has climbed from 1.04 in 2000, to 2.59 in 2024."

A citation impact of 1 reflects the global average. An impact of 2 means the article or research is cited twice as often as similar publications in the field. The school's 2.59 impact puts it near the pinnacle. In 2024, the impact factor among top medical schools was 3.07 at Oxford, 2.81 at Stanford, 2.38 at Johns Hopkins, and 2.4 at Harvard.

A major turning point came in 2005 with the National Medical Research Council's Clinician Scien-

tist Award, which offered funding to secure protected research time, thus giving clinicians an incentive to embark on studies.

At about the same time, Singapore launched initiatives to train clinician-scientists on how to carry out high-level research, while also bringing in some of the best foreign talent to augment the local pool.

Prof Foo said getting research funding is competitive but overall, the most meaningful and innovative research projects do get funded. "The money is there. But the bar for getting a research project awarded has been going up over the years."

The school decides on the projects to support based on several factors.

One factor is the researcher's achievements. Prof Foo said: "Track record is very important. Like when you see a person has a great idea now, and you can see that he's had a previous great idea that he took to great places, then you kind of think that, wow, this person has the capability to do the same again."

But the school is also conscious that everyone has to start somewhere, so "we don't want to have so high a bar where people without a track record cannot even get on the escalator".

For those starting on research, the school looks at commitment and "a certain level of sacrifice and readiness to go through the grind". Someone who is willing to pursue a PhD, for instance, would be missing out on three or four years of getting a higher salary as a clinician.

Another factor is research that is important to the country. "We pay attention to what's happening at the country level, what the Health Ministry wants to see, what are the important trends going forward, such as an ageing population."

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Some significant research efforts from NUS Medicine



A. PROF JASON LEE

Heat resilience

Project HeatSafe was set up in 2021 to investigate the impact of rising temperatures on the health and productivity of people in South-east Asia. The combination of high heat and humidity in the region holds back the body's ability to cool down through sweat evaporation, leading to heat exhaustion and heat stroke. Thermal physiologist Jason Lee's project demonstrated that thermal distress has detrimental impacts and consequences – affecting decision-making, productivity, fertility and pregnancy outcomes. Anchored at the Heat Resilience & Performance Centre, the Global Heat Health Information Network South-east Asia Hub was established in January 2025 to advance partnership, collaboration and advocacy in the region to protect and prepare for the impacts of heat on human health and well-being.

PROF CHONG YAP SENG

Growing Up in Singapore Towards healthy Outcomes (Gusto)

This comprehensive longitudinal study started in 2009 by Professor Chong Yap Seng, an obstetrician and gynaecologist who is the dean of NUS Medicine, is ongoing. It aims to understand how conditions in pregnancy and early childhood influence the health of women and children. Findings from Gusto have led to changes to policy and practice – such as the routine testing now of all pregnant women for gestational diabetes after the study discovered that half of them, especially those who were not overweight, went undiagnosed. Investigators have published 420 articles on various findings over the years since 2012.

PROF ROGER FOO

Project Reset

This project led by Professor Roger Foo aims to find the best way to prevent heart disease, which causes one in five deaths here. One in three people with underlying heart disease does not get early treatment, which could lead to better outcomes. The project, launched in 2023, is still recruiting participants, who will have their heart, liver and metabolism assessed. Of the 10,000 people whom researchers plan to recruit, 3,000 will have follow-ups over five years to pilot new treatments, including lifestyle changes. Project Reset is one of the initiatives that will be piloted at Health District @ Queenstown, launched in 2023, where the study team will work closely with policymakers, urban planners and community leaders to support the community's physical, social and mental well-being, and reduce environmental factors that contribute to heart disease.

PROF NICK WATTS

Sustainable medicine

The practice of healthcare leaves a huge climate footprint. NUS Medicine set up the Centre for Sustainable Medicine in 2023 aiming to accelerate the transition to net-zero emissions healthcare in Singapore and around the world. The centre is the first-of-its-kind institution in Asia and the largest in the world. Its head, Professor Nick Watts, a medical doctor who led the UK National Health Service's response to climate change, is pioneering clinically relevant and solutions-focused research that supports high-quality and low-carbon care. The healthcare system produces as much as 8 per cent of the world's greenhouse gas emissions – more than shipping and aviation combined. The centre has embedded the need for sustainability in medical school and offers the first-in-the-world master's degree in sustainable medicine.

PROF DARIO CAMPANA

CAR-T cell therapy

Using a technology developed in Professor Dario Campana's laboratory under the department of paediatrics at NUS Medicine, a team comprising Dr Esther Chan, Dr Bernice Oh and Professor Allen Yeoh at the National University Health System successfully treated both children and adults suffering from T-cell acute lymphoblastic leukaemia who have exhausted all other forms of treatment. Of the 17 patients treated between 2019 and 2023, 16 had complete remission within a month – with no cancer cells detected, even through ultra-sensitive tests. Eleven of these patients were foreigners who had sought treatment at National University Hospital. The first patient, who was treated when he was 10 years old, has not needed chemotherapy or a bone marrow transplant for five years.

PROF ZHANG CULIN

Women's health

Global health research generally focuses on men and non-Asians. The Global Centre for Asian Women's Health (GloW) hopes to address knowledge and practice gaps in women's health especially among Asians, emphasising cardio-metabolic and reproductive health, ageing and longevity, cancer screening and prevention, and mental health and wellness. GloW also aims to shift the paradigm of women's health from conventional sick care to preventive care. In March 2025, the school and Harvard University jointly launched the NUS Medicine-Harvard T.H. Chan Women's Health Initiative to promote women's health and improve global health outcomes for Asian women. The initiative is led by Professor Zhang Culin, a clinical epidemiologist who is director of GloW.

PHOTOS: NUS, A*STAR, CHONG JUN LIANG, ADOBE STOCK STRAITS TIMES GRAPHICS