PRESS RELEASE

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NUS Medicine and CHA University to harness artificial intelligence to tackle male infertility, uncovering new approaches to reverse fertility decline

Singapore, 10 November 2025 — Researchers from the Yong Loo Lin School of Medicine at the National University of Singapore (NUS Medicine) and CHA University in Korea have announced two major advances to extend reproductive longevity at the inaugural NUS-CHA Reproductive Medicine Symposium.

Asia is facing rapid demographic transitions with declining fertility rates across the region. Male infertility rates in East and South Asia are among the world's highest, contributing to over half of the global burden. With more couples deciding to have children later in life, ageing-related reproductive health challenges are increasingly becoming a concern despite advances in assisted reproductive technologies, while diagnostic and therapeutic gaps persist for both sexes.

Leveraging AI and big data for male infertility diagnostics

To tackle male infertility, a significant burden affecting nearly half of the millions of couples struggling to conceive in Asia and globally, Adjunct Assistant Professor Huang Zhongwei from the NUS Bia-Echo Asia Centre for Reproductive Longevity and Equality (ACRLE), based at NUS Medicine, and Associate Professor Lee Jae Ho from CHA University aim to combine artificial intelligence (AI) with comprehensive clinical datasets to create novel diagnostic and decision-support tools for male infertility.

“Male infertility remains one of the most under-diagnosed and under-treated aspects of reproductive medicine,” said Adj Asst Prof Huang, Deputy Director of ACRLE and Consultant at the National University Hospital’s Department of Obstetrics & Gynaecology. “By applying artificial intelligence to extensive clinical data, we can potentially identify hidden patterns and provide clinicians with actionable insights to improve male infertility diagnostics and treatment.”

New research on reversing age-related fertility decline

In parallel, researchers from NUS Medicine and CHA University, led by Adj Asst Prof Huang and Assoc Prof Lee respectively, have identified a way to reverse age-related embryo decline in preclinical models. Ageing has long been one of the biggest barriers to fertility and age-related decline in egg and embryo quality is a major hurdle in fertility, increasingly so as women decide to have children later in life.

Published in *Biomedicine & Pharmacotherapy*, the team demonstrated that using a novel compound called MIT-001 to target and block a major culprit behind age-related reproductive decline — ferroptosis— a form of cell death driven by iron and oxidative stress, embryo growth and blastocyst formation in older preclinical models showed significant improvements. Their findings show that by protecting ageing embryos from self-destructing at the cellular level, MIT-001 or similar mitochondria-targeted therapies could open the door to precision therapies for age-related infertility such as precision cellular rejuvenation, moving beyond current hormone-based interventions.

“Beyond fertility, the study may also open doors to tackle broader ageing issues because ferroptosis and mitochondrial dysfunction are also key drivers of ageing and degenerative diseases. Protecting a cell’s energy system may hold the key to extending healthy ageing itself,” said Adj Asst Prof Huang.

Themed "Advances in Reproductive Medicine in Asia-Pacific," the inaugural NUS-CHA Reproductive Medicine Symposium was a landmark gathering of global thought leaders, showcasing the latest assisted reproductive treatments, IVF discoveries and new possibilities for longevity. Panels and presentations addressed breakthrough topics such as microfluidic and AI-driven platforms in assisted reproduction, cellular aging in ovarian biology, 3D embryo imaging, artificial endometrium models, clinical automation in IVF laboratories, and innovative sperm selection technologies.

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About National University of Singapore (NUS)

The National University of Singapore (NUS) is Singapore’s flagship university, which offers a global approach to education, research and entrepreneurship, with a focus on Asian perspectives and expertise. We have 15 colleges, faculties and schools across three campuses in Singapore, with more than 40,000 students from 100 countries enriching our vibrant and diverse campus community. We have also established our NUS Overseas Colleges programme in more than 15 cities around the world.

Our multidisciplinary and real-world approach to education, research and entrepreneurship enables us to work closely with industry, governments and academia to address crucial and complex issues relevant to Asia and the world. Researchers in our faculties, 30 university-level research institutes, research centres of excellence and corporate labs focus on themes that include energy; environmental and urban sustainability; treatment and prevention of diseases; active ageing; advanced materials; risk management and resilience of financial systems; Asian studies; and Smart Nation capabilities such as artificial intelligence, data science, operations research and cybersecurity.

For more information on NUS, please visit www.nus.edu.sg.

About the NUS Yong Loo Lin School of Medicine (NUS Medicine)

The NUS Yong Loo Lin School of Medicine is Singapore's first and largest medical school. Our enduring mission centres on nurturing highly competent, values-driven and inspired healthcare professionals to transform the practice of medicine and improve health around the world.

Through a dynamic and future-oriented five-year curriculum that is inter-disciplinary and inter-professional in nature, our students undergo a holistic learning experience that exposes them to multiple facets of healthcare and prepares them to become visionary leaders and compassionate doctors and nurses of tomorrow. Since the School's founding in 1905, more than 12,000 graduates have passed through our doors.

In our pursuit of health for all, our strategic research programmes focus on innovative, cutting-edge biomedical research with collaborators around the world to deliver high impact solutions to benefit human lives.

The School is the oldest institution of higher learning in the National University of Singapore and a founding institutional member of the National University Health System. It is one of the leading medical schools in Asia and ranks among the best in the world (Times Higher Education World University Rankings 2025 by subject and the Quacquarelli Symonds (QS) World University Rankings by subject 2025).

For more information about NUS Medicine, please visit https://medicine.nus.edu.sg/