PRESS RELEASE

10 NOVEMBER 2026 | FOR IMMEDIATE RELEASE

NUS Medicine researchers identify blood proteins that may predict brain and cardiovascular health issues

Identified blood protein signatures are linked to cerebrovascular disease, cognitive decline, serious cardiovascular and cerebrovascular events, and mortality

Singapore, 10 November 2026 — Researchers from the Yong Loo Lin School of Medicine, National University of Singapore (NUS Medicine), have identified four proteins in the blood that could potentially help identify people at higher risk of worsening cerebrovascular disease, cognitive decline, serious heart and stroke-related events, and mortality.

Published in *Alzheimer's & Dementia: The Journal of the Alzheimer's Association*, the study analysed more than 1,400 proteins in blood samples spanning two Singapore-based research cohorts. The researchers identified novel blood protein signatures that consistently associated with cerebrovascular disease and poorer health outcomes. Cerebrovascular disease affects the brain's blood vessels and can cause small areas of tissue injury, microbleeds, and white matter damage, contributing to stroke, cognitive decline, and dementia. The study is the first to track its progression using large-scale protein profiling in a longitudinal Southeast Asian cohort, addressing a gap in research involving Asian populations.

Professor Christopher Chen, Deputy Chair of the Healthy Longevity Translational Research Programme (TRP) at NUS Medicine, who led the study, said, "Cerebrovascular disease is an important contributor to cognitive decline and dementia, particularly in our Asian population. By identifying blood proteins linked to changes in the brain and future cognitive and cardiovascular outcomes, we hope to move towards more precise ways of identifying people at risk and intervening earlier." Prof Chen is also from the Department of Pharmacology at NUS Medicine, Director, Memory Ageing & Cognition Centre, National University Health System (NUHS), and Senior Consultant, Department of Psychological Medicine, National University Hospital.

The researchers first studied 518 participants from a Singapore memory clinic cohort who underwent blood protein profiling, brain MRI scans, and cognitive assessments. Using an advanced proteomics platform, they measured over 1,400 proteins and mapped them against several lesion types related to cerebrovascular damage such as white matter hyperintensities,

lacunes, cerebral microbleeds, and cortical infarcts. Repeat brain imaging over time allowed the team to identify protein patterns associated with both existing disease and its progression, involving processes such as inflammation, immune responses, cell adhesion, and blood clotting. Identified blood protein signatures were further tested in another independent Singaporean cohort, where these proteins were also found to be associated with mortality. The study suggests that blood-based biomarkers could eventually complement brain imaging and clinical risk factors to identify people at greater risk of cerebrovascular disease, cognitive decline, as well as future health, cardiac and cerebrovascular outcomes. Further validation of these early findings is needed before they can be explored within clinical practice.

Dr Sim Ming Ann, first author of the study and PhD student at the Healthy Longevity TRP at NUS Medicine and Memory Ageing & Cognition Centre, NUHS, said, “By studying more than 1,400 proteins simultaneously and mapping them against MRI changes over several years, we gained a broader picture of the biological processes associated with cerebrovascular disease and identified proteins linked to both current disease and future health outcomes.” Dr Sim is also Consultant, Department of Intensive Care Medicine, Ng Teng Fong General Hospital.

Prof Chen added, “Our longer-term goal is to develop more accurate and clinically useful tools that can identify high-risk individuals before substantial brain damage or cognitive decline has occurred. If further validated, blood-based markers could potentially complement existing assessments, and help doctors tailor monitoring and preventive strategies more closely to every individual.”

The team aims to investigate the biological roles of these proteins and their potential use in future treatments or multi-marker tests for earlier and more personalised risk assessment.

This research is supported by the Singapore Ministry of Health through the National Medical Research Council (NMRC) Office, MOH Holdings Pte Ltd under the NMRC Centre Grant (MOH-001014, MOH-001018), Singapore Translational Research Investigator Award (IGMS-MOH-000707) and NMRC Research Training Fellowship (IGMS-MOH-001403), and the National Research Foundation, Singapore (NRF) under the NMRC Open Fund – Large Collaborative Grant (MOH-000500) administered by the Singapore Ministry of Health through the NMRC Office, MOH Holdings Pte Ltd. The research is also supported by the National University Health System (NUHS) Clinician Scientist Academy (NCSP2.0/2023/NUHS/SMA) and National University of Singapore (KCG/2023/NUSMED/SMA).

For media enquiries, please contact:
Gladys SIM
Manager, Communications
Yong Loo Lin School of Medicine,
National University of Singapore
Email: gladyssim@nus.edu.sg

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 around 15 NUS Overseas Colleges entrepreneurial hubs 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 in 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 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 2026 by subject and the Quacquarelli Symonds (QS) World University Rankings by Subject 2026).

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

About the National Medical Research Council (NMRC)
The NMRC was established in 1994 to oversee research funding from the Ministry of Health and support the development and advancement of biomedical research in Singapore, particularly in the public healthcare clusters and medical schools. NMRC engages in research strategy and planning, provides funding to support competitive research grants and core research enablers, and is responsible for the development of clinician scientists through awards and fellowships. The council's work is supported by the NMRC Office which is part of MOH Holdings Pte Ltd. Through its management of the various funding initiatives, NMRC promotes healthcare research in Singapore, for better health and economic outcomes.

About the National Research Foundation (NRF)

The National Research Foundation, Singapore (NRF), set up on 1 January 2006, is a department within the Prime Minister's Office. The NRF sets the national direction for research and development (R&D) by developing policies, plans and strategies for research, innovation and enterprise. It also funds strategic initiatives and builds up R&D capabilities by nurturing research talent. Learn more about the NRF at www.nrf.gov.sg.