

PRESS RELEASE

NUS Medicine professor becomes his own test subject in longevity study; biological age found to be 15 years younger

Singapore, 13 August 2026 – Most individuals encounter their health primarily through an annual health screening, which provides a limited snapshot of one's health status. A new study by the Yong Loo Lin School of Medicine, National University of Singapore (NUS Medicine), is challenging the way we think about health and longevity, by seeking to understand what occurs between those assessments, focusing on function rather than static markers, tracking how physiology changes moment to moment.

Led by Professor Dean Ho, Director of the Institute for Digital Medicine (WisDM) at NUS Medicine, the study took an unusual and highly personalised approach: Prof Ho became the sole subject of the study.

The study, named DELTA, was designed around the central idea that everyone has their own biological baseline, shaped by age, stress, sleep, food, exercise and illness and that this baseline shifts over time. To examine these changes, the team introduced a series of lifestyle interventions — including varying fasting durations, exercise routines and nutrition adjustments — while monitoring how Prof Ho's biology responded in real time. The regimen included around 20 hours of fasting each day, multiple 48-hour fasts, 90 minutes of strength or cardiovascular training every morning, and a structured diet centred on leafy greens, seeds, olive oil, lean protein and other Mediterranean-style foods, with beverages limited to water, electrolytes, black coffee and black tea without milk and sugar.

Prof Ho, aged 47, said, "We started this study to better understand what happens between annual health screenings, which most people rely on as their measure of health — to look beyond static markers and focus on how the body functions and changes in real time. We know people are different from each other, but we are also different from ourselves over time. Everyone has their own 'DELTA' — a unique, evolving set of data that reflects the fact that health is a story, not a snapshot."

Published in the peer-reviewed journal [PLOS One](#), the study began in mid-August 2024 and is still ongoing. Prof Ho also wore three wearables — Whoop, Garmin, and Apple Watch — for about eight months, allowing the study to track changes over a longer duration than typical consumer wearable reports. It builds on an earlier 2024 paper in [PNAS Nexus](#) that examined Prof Ho's metabolic shifts over a long period. In this latest paper, the DELTA study captured

the body's metabolic switch in real time over very short timeframes — even within minutes, which revealed just how much can be missed about how efficiently metabolism responds to acute stress. Metabolic switching refers to how quickly the body can switch between burning sugar and burning fat, and faster switching usually means better metabolic flexibility.

The DELTA regimen resulted in several notable improvements:

- For someone of Prof Ho's age, the average metabolic switching is 36-72 hours, or even longer. It often becomes less efficient as one grows older. The study demonstrated that Prof Ho's metabolic switching speed improved over time, from more than 24 hours to 16.5 hours.
- A custom artificial intelligence (AI) copilot that was developed by the research team also estimated Prof Ho's biological age at around 32, nearly 15 years younger than his actual age. Biological age is typically estimated from a single snapshot of molecular or physiological markers, providing a static assessment of a person's health and disease risk at a given point in time. However, such approaches offer limited insight into how well the body can respond to and recover from stress — a key hallmark of healthy ageing. Instead of relying on a single snapshot, the AI-powered healthspan copilot captures real-time molecular and physiological responses to stress to measure true biological resilience, revealing how quickly the body adapts and recovers.
- Prof Ho's resting heart rate improved, falling from 65 beats per minute (bpm) to 46 bpm, which can indicate more efficient heart function and better recovery.
- Sleep architecture improved, with sleep shifting from past midnight to around 9pm, total sleep increasing from about 5 hours to nearly 8 hours, more deep sleep, and less time awake during the night.
- Gut microbiome health also showed positive changes, with no detectable *Fusobacterium* across all measurements, and evidence of improved energy conservation during certain fasting periods.

Through the study, Prof Ho and his team hope DELTA will empower individuals to engage meaningfully with their own health data, enabling them to make informed lifestyle changes instead of following generic routines or striving for a one-size-fits-all ideal. DELTA builds on a longevity landscape where many existing approaches — from conventional drug development to biological age clocks — continue to rely on static, snapshot-based measurements. Even when AI is incorporated, these systems often aggregate periodic data rather than capturing how the body functions and adapts in real time.

“DELTA represents a shift towards function-based longevity science by measuring physiological resilience instead of relying on static snapshots. We hope this work will not only help redefine how healthy ageing is understood, but also showcase Singapore's growing role in pioneering the future of personalised longevity research,” added Prof Ho.

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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 more than 20 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, research centres of excellence, corporate labs and more than 30 university-level research institutes 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.

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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 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/>