



## PRESS RELEASE

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### **NUS Medicine researchers use nutritional supplement to shrink breast cancer tumours**

*Singapore, 2 August 2022* —Each year, over 2,000 women are diagnosed with breast cancer and more than 400 die from the disease (Singapore Cancer Registry annual report 2018). One in 13 women will get breast cancer in their lifetime.

A diagnosis of breast cancer is traumatic and life altering for women and their loved ones. This potentially deadly disease is often treated by surgical removal of the breast cancer tumour followed by chemotherapy. Side effects associated with chemotherapy can be severe and tumour recurrence may result in a shortened lifespan for vulnerable women.

In an encouraging development, researchers from the Yong Loo Lin School of Medicine at the National University of Singapore (NUS Medicine) have succeeded in using a plant-derived nutrient supplement to shrink breast cancer tumours in preclinical models. The team at NUS Medicine used a novel nanotechnology to repurpose a nutritional component in plants to become a potent treatment for breast cancer.

As the nanotechnology converts the plant nutrient into chemotherapy only at the site of the tumour, the treatment is both potent and free from side effects at the same time. Although the study was performed in preclinical models using the new technology, human breast cancer cells were used as the target: these responded with a complete remission. The researchers hope to next apply the technology in clinical trials and for additional solid tumours which are difficult to treat or are difficult to remove via standard surgery.

The use of plant-based natural products transformed by a process called 'bioorthogonal catalysis' to shrink breast cancer tumours is ground-breaking technology, said Chester Drum, Assistant Professor at NUS Medicine and Senior Consultant in the Department of Cardiology, National University Heart Centre, Singapore. In essence, a benign nutritional supplement, IAA, was repurposed to become a potent treatment for breast cancer tumours. IAA is present in the everyday diet and thus has no side effects.

“In the new approach, following administration of the plant-derived molecule, an engineered nanotechnology converts the molecule into a potent chemotherapeutic only at the site of cancer, meaning that side effects in the rest of the body can be avoided,” added Assistant Professor Drum. Because the chemical conversion of natural product to chemotherapy is not normally present in the human body, it is called 'bioorthogonal catalysis'.

Although the study treated breast cancer tumours derived from human patients, preclinical models were used as the experimental cancer host as the technology is still too early to be used in hospital clinics. The researchers plan to next develop a simple gel which can be placed at the site of a tumour removal after a surgery and require the patient to only eat a nutritional supplement to prevent recurrence of the cancer.

The paper, which was published in *ACS Nano*, can be found here:

<https://pubs.acs.org/doi/full/10.1021/acsnano.1c11560>

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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 16 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](http://www.nus.edu.sg).

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

The Yong Loo Lin School of Medicine, National University of Singapore (NUS 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 Asia's leading medical schools and ranks among the best in the world (Times Higher Education World University Rankings 2022 by subject and the Quacquarelli Symonds (QS) World University Rankings by subject 2022).

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