PRESS RELEASE

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NUS researchers identify novel protein to prevent nerve numbness and pain from chemotherapy drugs

_Discovery holds potential for treatment of other forms of neuropathy, such as those caused by nerve injury, autoimmune disease, or diabetes_

_Singapore, 17 February 2020_ — A team of researchers from the NUS Yong Loo Lin School of Medicine has identified a novel protein that would prevent the development of neuropathy in cancer patients who receive chemotherapy.

Chemotherapy is one of the most commonly recommended treatments for many forms of cancer. One major side effect, however, is peripheral neuropathy, or the damage or dysfunction of one or more nerves that typically results in numbness, tingling, muscle weakness and pain in the affected area. It frequently starts in a patient’s hands and feet, though other regions and parts of the body can also be affected.

At the moment, there is no way to prevent or treat neuropathy caused by chemotherapy drugs. The only option is to limit or discontinue the chemotherapy treatment. As a result, many patients are not able to tolerate chemotherapy well.

In a recent study published by the Journal of Biological Chemistry, a team of researchers jointly led by Assistant Professor Raymond Deron Herr and Assistant Professor Raghav Sundar from the NUS Yong Loo Lin School of Medicine set out to examine whether S1P₂, a receptor protein that resides on the surface of cells in the
nervous system, is a potential target in the treatment of chemotherapy-induced neuropathy. The team first looked at the effects of platinum-based chemotherapy drugs, such as cisplatin, on the regulation of S1P2 and found that chemotherapy alters S1P2 activity. The team further demonstrated that the activation of S1P2 with a drug-like compound, can protect the nerve cells from damage and pain. This is in contrast to the accumulation of free radicals in nerves, leading to nerve degeneration when the receptor is removed. The team concluded that it is possible to block both the nerve injury and the pain when S1P2 is activated with a drug while administering cisplatin.

There are three major classes of drugs that cause neuropathy: platinum compounds (cisplatin and oxaliplatin), taxanes (paclitaxel), and a targeted medication known as bortezomib.

“While the study focused on the effects of cisplatin, based on what we know about the molecular processes, it is likely that an S1P2 drug will work in all cases of chemotherapy-induced neuropathy. Furthermore, it is possible that such a drug could treat many other forms of neuropathy, such as those caused by nerve injury, autoimmune disease, or diabetes,” said Dr Herr.

“Neuropathy or numbness from chemotherapy is a common and debilitating side-effect faced by patients, with few proven treatments. Our study provides a deeper understanding of the biology of this condition, allowing potential treatments to reduce chemotherapy-induced neuropathy to be developed. We are currently exploring new drug molecules that would allow the activation of S1P2 in a more effective and stable manner,” added Dr Sundar, who is also a Consultant with the Department of Haematology-Oncology at the National University Cancer Institute, Singapore (NCIS) and the National University Hospital.

The clinical data for this study was generated from Singaporean cancer patients undergoing treatment at NCIS, a National University Health System institution.

In a nod to Dr. Herr and Dr. Sundar’s groundbreaking research in the area of pharmacology, the study has been selected as the cover story in the 24 Jan edition of Journal of Biological Chemistry.
For media enquiries, please contact:

Sally TOH
Senior Assistant Director
Communications
Yong Loo Lin School of Medicine
National University of Singapore
DID: +65 6772 6983
Email: sally.toh@nus.edu.sg

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

Established in 1905, the NUS Yong Loo Lin School of Medicine is the first institution of higher learning in Singapore and the genesis of the National University of Singapore.

The School offers one of the finest undergraduate medical programmes in the Asia Pacific region and enjoys international recognition and respect. The Times Higher Education World University Rankings 2019 by subject and Quacquarelli Symonds (QS) World University Rankings by Subject 2019 list NUS Medicine as the leading medical school in Asia.

It admits 300 students to the MBBS degree programme annually and its principal missions are to educate and train the next generation of healthcare professionals, and foster research that will help to advance the practice of medicine.

The 18 NUS Medicine departments in the basic sciences and clinical specialties work closely with the Centre for Medical Education, the Centre for Biomedical Ethics, the Centre for Healthcare Simulation as well as the restructured public hospitals to ensure that teaching and research are aligned and relevant to Singapore’s healthcare needs. The School is a founding institutional member of the National University Health System.

For more information about NUS Medicine, please visit http://nusmedicine.nus.edu.sg

About the National University Hospital

The National University Hospital is a tertiary hospital and major referral centre with over 50 medical, surgical and dental specialties, offering a comprehensive suite of specialist care for adults, women and children. It is the only public hospital in Singapore to offer a paediatric kidney and liver transplant programme, in addition to kidney, liver and pancreas transplantation for adults.

The Hospital was opened on 24 June 1985 as Singapore’s first restructured hospital. Each year, the Hospital attends to more than one million patients.
As an academic health institution, patient safety and good clinical outcomes are the focus of the Hospital. It plays a key role in the training of doctors, nurses, allied health and other healthcare professionals. Translational research is pivotal in the Hospital’s three-pronged focus, and paves the way for new cures and treatment.

A member of the National University Health System, it is the principal teaching hospital of the NUS Yong Loo Lin School of Medicine and the NUS Faculty of Dentistry.

For more information about the NUH, visit https://www.nuh.com.sg/Pages/Home.aspx