

FOR IMMEDIATE RELEASE

Breakthrough discovery presents hope for treating fibrotic diseases which cause organ impairment

- *Duke-NUS, SingHealth and NHCS researchers discover a key driver of cardiac and renal fibrosis*
- *Findings will be presented in the Late-Breaking session at the European Society of Cardiology Congress 2017 in Barcelona*

Singapore, 28 August 2017 – A breakthrough discovery in the field of cardiovascular fibrosis research made at Duke-NUS Medical School (Duke-NUS) and National Heart Centre Singapore (NHCS) has been licensed to a newly launched company Enleofen Bio Pte Ltd, a Singapore-funded biotechnology start-up.

Enleofen Bio plans to use the intellectual property (IP) derived from the Duke-NUS and NHCS research to develop first-in-class therapeutics for the treatment of multiple fibrotic human diseases including cardiac and pulmonary fibrosis. Fibrosis is the formation of excessive connective tissue, similar to the formation of scar tissue during the healing process; however, the excessive connective tissue in fibrotic disease does not heal but rather disrupts the structure and function of the organ and tissue where it forms, rendering it diseased. This process may affect many tissues within the body and is the main pathology behind heart and renal failure.

Professor Stuart Cook along with Assistant Professor Sebastian Schafer, who are both from NHCS and Duke-NUS' Programme in Cardiovascular & Metabolic Disorders, carried out the translational research to identify the key drivers of chronic fibrotic disease in heart, kidney and other tissues.

The team's findings will be presented at the Annual Congress of the European Society of Cardiology in Barcelona, on 28 August 2017, 8:30hrs CET.

"We discovered that a specific cytokine¹ is a key driver and potentiator of TGF-beta² in cardiac fibrosis. Ironically, it has been in plain sight for many years, but unfortunately for patients, this target was completely mischaracterised and hence overlooked," explained Professor Cook, who is Director of the Programme in Cardiovascular & Metabolic Disorders at Duke-NUS, Director of the National Heart Research Institute Singapore, as well as a scientific founder of Enleofen Bio.

The development of the IP was facilitated by a unique collaborative model between Duke-NUS, NHCS and the National Health Innovation Centre Singapore. All three organisations partnered with Professor Cook to de-risk the discovery and prepare therapeutic technologies for commercial readiness as part of an 'Active Translation Model'. The Enleofen Bio agreement represents a significant milestone in the development and commercialisation of fundamental biomedical research conducted at Duke-NUS and SingHealth, which promises to lead to improved healthcare outcomes.

“We are very excited to see this great Singapore-derived therapeutics platform now under development at Enleofen Bio,” said Centre for Technology and Development’s (CTeD) Director and Duke-NUS Vice Dean for Innovation and Entrepreneurship, Professor David Epstein. “We have found the right partners to take Professor Cook’s work to the next level of clinical application to improve peoples’ health and lives.”

“The licensing of this IP demonstrates Duke-NUS and SingHealth’s dedication to doing impactful research and translating that science to medical solutions,” said Senior Vice Dean of Research at Duke-NUS, Professor Patrick Casey.

Professor Terrance Chua, Medical Director of NHCS, who is also Group Chairman Medical Board, SingHealth, and Academic Chair of the SingHealth Duke-NUS Cardiovascular Academic Clinical Programme added: “Professor Cook led a group of dedicated clinicians and scientists within SingHealth and Duke-NUS to do groundbreaking research on fibrosis, and SingHealth and CTeD accelerated that progress to commercialisation. We are confident that such innovative research, which plays a significant role in setting new healthcare standards and transforming models of care, will continue to aid healthcare professionals to apply the science into practical and clinical solutions to improve patient care and treatment.”

Notes:

1. **Cytokines** are a broad and loose category of small proteins that are important in cell signaling. Their release has an effect on the behaviour of cells around them.
2. **TGF-beta** (transforming growth factor beta) is a kind of cytokine that plays an important role in growth and development, inflammation, repair and host immunity.

About Duke-NUS Medical School

The Duke-NUS Medical School (Duke-NUS, 杜克 — 新加坡国立大学医学院) was established in 2005 as a strategic collaboration between the Duke University School of Medicine, located in North Carolina, USA, and the National University of Singapore (NUS). Duke-NUS offers a graduate-entry, four-year MD (Doctor of Medicine) training programme based on the unique Duke model of education, with one year dedicated to independent study and research projects of a basic science or clinical nature. Duke-NUS also offers MD/PhD and PhD programmes. Duke-NUS has five Signature Research Programmes: Cancer and Stem Cell Biology, Neuroscience and Behavioural Disorders, Emerging Infectious Diseases, Cardiovascular and Metabolic Disorders, and Health Services and Systems Research.

Duke-NUS and SingHealth have established a strategic partnership in academic medicine that will guide and promote the future of medicine, tapping on and combining the collective strengths of SingHealth’s clinical expertise and Duke-NUS’ biomedical sciences research and medical education capabilities.

For more information, please visit; www.duke-nus.edu.sg

For more information about the Centre for Technology and Development, please visit: www.duke-nus.edu.sg/cted/

About the National Heart Centre Singapore

The National Heart Centre Singapore (NHCS, 新加坡国家心脏中心) is a 185-bed national and regional referral centre for cardiovascular diseases. A one-stop facility with the largest heart specialists group in Singapore, NHCS treats complex cases and sees the highest volume of heart patients locally. Each year, the Centre handles over 120,000 outpatient consultations, 6,000 interventional and surgical procedures and 9,000 inpatients. Its outcomes for heart attack treatment, balloon angioplasty with stenting and coronary bypass surgery have been shown to be equivalent to international standards. NHCS is the first heart centre outside USA and in Asia to receive the prestigious Joint Commission International (JCI) since 2005, which is an assurance for safe and quality patient care for the patients.

For more information, please visit www.nhcs.com.sg.

About National Health Innovation Centre Singapore

The National Health Innovation Centre Singapore (NHIC) was established in 2014 to accelerate the translation of healthcare innovations arising from the publicly-funded clinical research sector in Singapore. Through its project funding and strategic guidance, NHIC supports the development of innovative technologies towards commercially attractive products.

For more information about NHIC, please visit: www.nhic.sg.

About Enleofen Bio

In 2017 the start-up company Enleofen Bio Pte Ltd was founded as a spin-out from National Heart Centre Singapore (NHCS), SingHealth and Duke-NUS Medical School with Series A funding. Enleofen Bio develops first-in-class therapeutics for the treatment of fibrotic human diseases. Fibrotic disorders include diseases of the skin, lungs, heart, eye and kidneys and are a major health burden in Singapore and around the world. The initial discovery science and drug target validation was carried out at NHCS and Duke-NUS, funded by Professor Stuart Cook's funding from the National Medical Research Council (NMRC) as well as Goh Foundation and Tanoto Foundation. Multiple patent applications and a number of advanced drug candidates arising from the scientific work have been licensed to the company giving it a significant position in drug discovery and development for the treatment of fibrosis. The company aims to develop drugs for the treatment of multiple fibrotic diseases for which there are currently no treatment options.

For more information about Enleofen Bio, please visit www.enleofen.com