NEWS RELEASE

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NTU Singapore to embark on research to tackle ageing-related joint condition with S$1.2 million gift from StemiGen Therapeutics

Scientists at **Nanyang Technological University, Singapore (NTU Singapore)** are aiming to develop novel treatments to tackle a common ageing-related joint condition called osteoarthritis, supported by a S$1.2 million gift from **StemiGen Therapeutics**, a Singapore biotechnology company.

Osteoarthritis, a condition characterised by chronic knee, back and joint pains, is a highly prevalent disease in society, and commonly related to ageing.

The disease is caused by the degradation of articular cartilage - white tissue that covers the ends of bones where they meet to form joints. This degradation causes excessive bone growth, joint swelling, and inflammation, leading to acute pain and the gradual loss of mobility.

In Singapore, musculoskeletal disorders including osteoarthritis is among the leading cause of disability, ill-health, or early death.[1] About 80% of patients have limited movement and 25% cannot perform basic daily activities.[2] Moreover, the disease is costly to treat. In the United States, medical care top US$185 billion per year for 27 million osteoarthritis patients, according to published figures.[3]

While there are many research initiatives on preventing or slowing the worsening of osteoarthritis, there are no drugs or treatments that can halt or reverse disease progression.

[1] Singapore Burden of Disease Study 2017

[2] T. Neogi, The epidemiology and impact of pain in osteoarthritis, Osteoarthritis and Cartilage 21(9) (2013) 1145-1153.

[3] S. Rundell, A. Goode, P. Suri, P. Heagerty, B. Comstock, J. Friedly, L. Gold, Z. Bauer, A. Avins, S. Nedeljković, D. Nerenz, L. Kessler, J. Jarvik, The impact of comorbid knee and hip osteoarthritis on longitudinal clinical and health care use outcomes in older adults with new visits for back pain, Archives of Physical Medicine and Rehabilitation 98 (2016).

Supported by the new S$1.2 million **StemiGen – Lee Kong Chian School of Medicine (LKCMedicine) Regenerative Medicine Research Fund**, NTU is taking the lead to close the gap in osteoarthritis research, and to develop effective treatments that can benefit this growing group of patients, amid an ageing population in Singapore.

This research initiative is in line with the **NTU 2025 strategic plan**, which aims to address some of the grand challenges facing humanity including responding to the needs and challenges of healthy living and ageing.

Research projects to investigate stem cell and drug delivery for osteoarthritis

Two research projects on knee osteoarthritis will benefit from the funding, which are underway in the laboratory of **LKCMedicine Principal Investigator, Associate Professor of Stem Cell Science and Regenerative Medicine Yen Choo.**

In the late stage of osteoarthritis, a surgical procedure to realign the leg bones using artificial bone substitutes, such as 3D printed scaffolds, is often performed on patients to relieve pressure on the affected joint. However, the natural process of bone formation and healing can take a while post-surgery.

To accelerate this regeneration process and healing, a research team led by Assoc Prof Choo will investigate a method of incorporating osteogenic (bone) stem cells into 3D printed scaffolds for bone regeneration.

StemiGen Therapeutics will contribute to the project by manufacturing large quantities of clinical grade stem cells for the application. The project will also involve two other industry collaborators, NTU spin-off **Osteopore International** and London-based stem cell technology company **Plasticell**.

Another project led by Assoc Prof Choo will look at cartilage repair for knee osteoarthritis using drugs. Previous research has discovered drugs that can stimulate cartilage growth, but successful drug delivery remains a problem.

With support from NTU materials scientists, biochemical engineers and biological sciences experts, the research team hopes to develop a method to deliver the drugs and retain them in the joint effectively, leading to cartilage regeneration and consequently, to delay or reverse progression of knee osteoarthritis.

The NTU research team anticipates product development and animal trials to take place approximately within three years, and human clinical trials to start thereafter if successful.

Assoc Prof Choo said, “A rapidly ageing population in Singapore and around the world presents an unprecedented set of challenges for healthcare systems. Osteoarthritis is one of the most prevalent diseases associated with ageing and finding an effective treatment or therapy will have profound socio-economic consequences.”

Mr Lim Kun Lim, Chairman, StemiGen Therapeutics, said, “It has been my dream to be able to make transformational changes in upping the quality of life through breakthroughs in medical research. We hope that our gift of S$1.2 million can, in some small way, invigorate efforts to fulfilling possibilities.”

S$1.2 million fund to advance regenerative medicine research

The S$1.2 million gift to NTU was formalised at a signing ceremony today between **Ms Lien Siaou-Sze, NTU Vice President, University Advancement** and **Dr James Hsieh**, **CEO, StemiGen Therapeutics,** which was attended by Guest-of-Honour, **Professor Benjamin Seet, Deputy Group CEO (Education & Research) of the National Healthcare Group.**

The gift to NTU is the first by the company to a single beneficiary. With matching by the Singapore government, the total fund raised is S$2.4 million under the LKCMedicine Endowment Fund.

Dr Hsieh said, “Stem cell therapy has tremendous potential to revolutionize healthcare in Singapore. Over the past two decades, an aging population has brought about challenges including chronic conditions and other diseases that current treatments are unable to cure. To provide better treatments to change those outcomes, regenerative medicine is part of the answer. Creation of the StemiGen – LKCMedicine Regenerative Medicine Research Fund will be a first step to develop the know-how and technologies to manufacture and administer stem cell therapies safely, effectively, and affordably. The fund will also be used to support in the development of more qualified regenerative medicine scientists and practitioners.”

Professor Joseph Sung, LKCMedicine's Dean and NTU Senior Vice President (Health and Life Sciences), said: “NTU Singapore is well-placed to bring together the diverse mix of scientists for highly interdisciplinary research such as regenerative medicine. Leveraging the university’s strengths in engineering and biomedical research, and LKCMedicine’s focus on translational research, the gift will go towards developing innovative tools and therapies that will be beneficial for patients.”

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About Nanyang Technological University, Singapore

A research-intensive public university, Nanyang Technological University, Singapore (NTU Singapore) has 33,000 undergraduate and postgraduate students in the Engineering, Business, Science, Humanities, Arts, & Social Sciences, and Graduate colleges. It also has a medical school, the Lee Kong Chian School of Medicine, set up jointly with Imperial College London.

NTU is also home to world-class autonomous institutes – the National Institute of Education, S Rajaratnam School of International Studies, Earth Observatory of Singapore, and Singapore Centre for Environmental Life Sciences Engineering – and various leading research centres such as the Nanyang Environment & Water Research Institute (NEWRI) and Energy Research Institute @ NTU (ERI@N).

Ranked amongst the world's top universities by QS, NTU has also been named the world's top young university since 2014. The University's main campus is frequently listed among the Top 15 most beautiful university campuses in the world, and it has 57 Green Mark-certified (equivalent to LEED-certified) building projects, of which 95% are certified Green Mark Platinum. Apart from its main campus, NTU also has a campus in Singapore's healthcare district.

Under the NTU Smart Campus vision, the University harnesses the power of digital technology and tech-enabled solutions to support better learning and living experiences, the discovery of new knowledge, and the sustainability of resources.

For more information, visit www.ntu.edu.sg

About StemiGen Therapeutics

StemiGen Therapeutics is a subsidiary of the OGL Group (OGL). OGL has medical and aesthetic clinics in Singapore and licensed stem cell facilities in both Singapore and Malaysia. OGL offers patients one-stop convenience to support patients' health

and wellness needs, offering essential primary healthcare services and specialised treatments.

StemiGen Therapeutics is a Singapore-based biotechnology company focused on harnessing the regenerative properties of human stem cells, and their derivatives, to treat a wide range of conditions and enhance quality of life. Our founding team includes scientists and physicians with extensive experience in stem cell research and clinical application.

For more information, visit www.oglgroups.com