

A*STAR'S IME + BIOSPARK



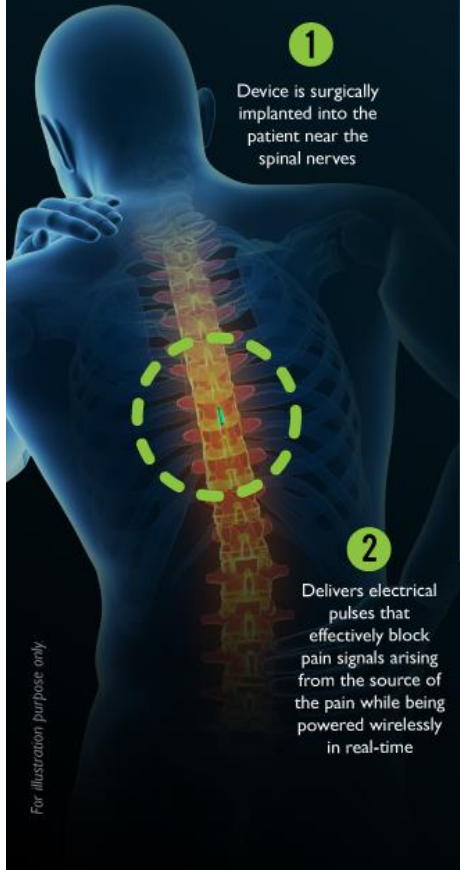
THE **NEW** WIRELESS IMPLANTABLE DEVICE

TO IMPROVE CHRONIC PAIN MANAGEMENT

This breakthrough development is expected to **treat chronic pain such as failed back surgery syndrome, nerve-related pain and complex regional pain syndrome** – a condition that affects one of the limbs due to an injury or trauma to the limb.

HOW IT WORKS

Just **2** simple steps!



1

Device is surgically implanted into the patient near the spinal nerves

2

Delivers electrical pulses that effectively block pain signals arising from the source of the pain while being powered wirelessly in real-time

For illustration purpose only

WIRELESS IMPLANTABLE DEVICE

VS

EXISTING NEURO-STIMULATORS

As **SMALL** as a grain of rice



12MM

Operates **WIRELESSLY** in real-time

NO BATTERY required



Approximate size of a stopwatch. Longer than **54MM**

Operate from an external device, connected to electrodes implanted in the spine

Require **BATTERY REPLACEMENTS**



**MEDIA RELEASE
FOR IMMEDIATE RELEASE**

13 January 2016

NEW WIRELESS IMPLANTABLE DEVICE FROM A*STAR'S IME AND BIOSPARK TO IMPROVE CHRONIC PAIN MANAGEMENT

Novel device will also eliminate the need to undergo surgery for battery replacements

Singapore—Patients who suffer from chronic pain will soon have an option of pain mitigation, thanks to a new wireless implantable chronic pain management device being developed by A*STAR's Institute of Microelectronics (IME) and local biotechnology firm Biospark Technologies Pte Ltd (Biospark).

Neurostimulators are surgical implants which can be a long-term solution for patients suffering from pain as a result of injury, surgery or health conditions. Neurostimulators trigger mild electrical signals to block pain signals from reaching the brain and are effective in relieving chronic pain. Patients will only feel a tingling or numbing sensation instead of constant pain. However, such devices function on batteries, and every few years, the patients require additional surgery to replace the batteries.

The collaboration will leverage IME's expertise in neural stimulation research and deep capabilities in application specific integrated circuit (ASIC) design and Biospark's expertise in the research and technology commercialisation of implantable wireless diagnostic and treatment devices.

By developing an implantable device that can be powered wirelessly, IME and Biospark aim to eliminate the need for invasive surgery for battery replacement. The device is expected to be as small as a rice grain (approximately 12 millimetres long), and will pave the way for smaller neurostimulators that are not dependent on bulky batteries.

The technology behind this device is a microchip that enables highly-efficient wireless data transmission and ultra-low power signal acquisition. The device is surgically implanted into the patient near the spinal nerves, and delivers electrical pulses that effectively block pain signals coming from the source of the pain while being powered wirelessly in real-time. (Please refer to illustration on page 1). The

development is expected to be a breakthrough and can treat chronic pain such as failed back surgery syndrome, nerve-related pain and complex regional pain syndrome – a condition that affects one of the limbs due to an injury or trauma to the limb.

The IME-Biospark partnership targets to develop a functional prototype in a year's time and will conduct extensive clinical studies to ensure patient safety in large-scale deployment.

“Medical technologies such as implantable electronics are increasingly shaping the future of health care, providing quality treatment and convenience to patients. IME's collaborations with industry including local enterprises such as Biospark will continue to catalyse the growth of impactful innovations that deliver value to the healthcare community”, said Prof. Dim-Lee Kwong, Executive Director of IME.

Biospark's Co-founder and Director Mdm. Long Qiongzhen said, “Biospark is excited to be able to make a real difference in the lives of chronic pain patients throughout the world. IME's deep technological know-how will significantly accelerate the commercial readiness of our products.”

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About the A*STAR Institute of Microelectronics (IME)

The Institute of Microelectronics (IME) is a research institute of the Science and Engineering Research Council of the Agency for Science, Technology and Research (A*STAR). Positioned to bridge the R&D between academia and industry, A*STAR IME's mission is to add value to Singapore's semiconductor industry by developing strategic competencies, innovative technologies and

intellectual property; enabling enterprises to be technologically competitive; and cultivating a technology talent pool to inject new knowledge to the industry. Its key research areas are in integrated circuits design, advanced packaging, bioelectronics and medical devices, MEMS, nanoelectronics, and photonics.

For more information on IME, please visit www.ime.a-star.edu.sg.

About the Agency for Science, Technology and Research (A*STAR)

The Agency for Science, Technology and Research (A*STAR) is Singapore's lead public sector agency that spearheads economic oriented research to advance scientific discovery and develop innovative technology. Through open innovation, we collaborate with our partners in both the public and private sectors to benefit society.

As a Science and Technology Organisation, A*STAR bridges the gap between academia and industry. Our research creates economic growth and jobs for Singapore, and enhances lives by contributing to societal benefits such as improving outcomes in healthcare, urban living, and sustainability.

We play a key role in nurturing and developing a diversity of talent and leaders in our Agency and Research Institutes, the wider research community and industry. A*STAR oversees 18 biomedical sciences and physical sciences and engineering research entities primarily located in Biopolis and Fusionopolis.

For more information on A*STAR, please visit www.a-star.edu.sg.

About Biospark Technologies Pte Ltd

Biospark Technologies Pte Ltd is a Singapore-based company developing innovative biomedical technologies that aims to revolutionize the way patients receive quality medical care. Its engineering team includes experts and scientists in electronics, biomedical system design and manufacturing with experience in the commercialization of implantable medical devices.