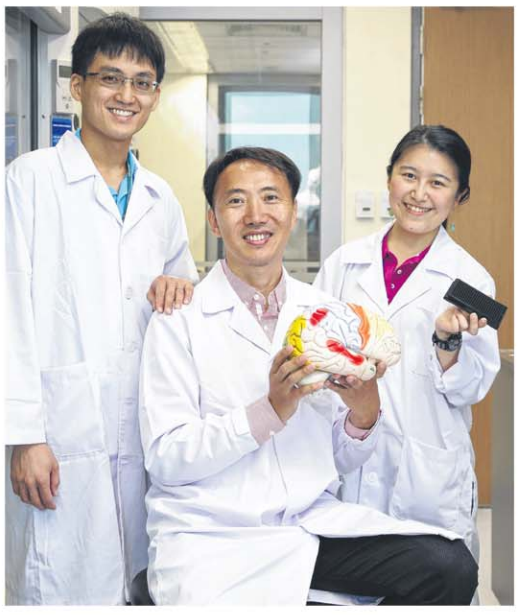
Source: *The Straits Times,* pB7
Date: 17 August 2015



Professor Chang Young-Tae, the lead researcher, flanked by graduate student Er Jun Cheng (left) and research fellow Teoh Chai Lean. ST PHOTO: YEO KAI WEN

New tool could help treat neuro diseases

NUS, A*Star scientists create world's first chemical dye to target and stain live neurons

Audrey Tan

Scientists here have come up with a tool that can help researchers better understand neurological disorders such as Alzheimer's and Parkinson's diseases.

The tool is a chemical dye that can selectively target and stain live neurons – nerve cells essential for human thought and movement.

The first such dye in the world, it was created by scientists from the National University of Singapore (NUS) and the Agency for Science, Technology and Research (A*Star), and unveiled on Friday at a media briefing.

When injected into the tail vein of mice, the dye called Neuron Orange, or NeuO, stained the animal's neurons a fluorescent orange, allowing them to be easily distinguished from other types of brain cells.

Previously, other chemical dyes were unable to selectively stain neurons, and antibodies could be used to stain only dead neurons.

NeuO could overcome these barriers to studying neurons in their natural state, said lead researcher Chang Young-Tae, who is from the NUS chemistry department and is head of the Laboratory of Bioimaging Probe Development in A*Star's Singapore Bioimaging Consortium.

The dye could allow scientists and clinicians to understand the progression of diseases such as Alzheimer's and Parkinson's, which are caused by the degeneration of neurons.

Currently, patients with such diseases are injected with a radioactive chemical known as 18F-fluorodeoxyglucose.

A trigger, such as an object waved in front of the patient's eyes, is then introduced before a positron emission tomography (PET) scan is taken of the patient. The scan will show the brain region activated by the trigger.

But such a method merely highlights the activated region of the brain, whereas NeuO could be used to highlight the very cells affected by the disease, said Prof Chang.

"There could also be complications with using 18F-fluorodeoxyglucose, as the results could be affected by other factors, such as if the patient has cancer, or if he just had a heavy meal," he added.

But, as with all innovations, testing NeuO on human subjects could still take "several years" of work, Prof Chang said.

There are at least four different types of cells found in the human brain, with neurons making up only about 10 per cent of the mix, making their detection harder.

Prof Chang said: "NeuO can be a valuable tool for illuminating the intricate neuronal networks that govern neural function and visualising how neurons differentiate, develop dendrite synapses (through which information flows between neurons), and interact with other cells in the brain."

Commenting on the new dye, Associate Professor Reshma Merchant, head and senior consultant of the Division of General Medicine at the National University Hospital, noted that current Alzheimer's treatments deal only with symptoms and not causes.

"There are many underlying causes for Alzheimer's and, depending on the cause, imaging studies can be used to identify response to treatment," she said.

audreyt@sph.com.sg