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Singapore reveals novel ways to treat and study neurodegenerative diseases

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Studies found that stem cells can be transplanted into the brain to repair damaged tissues after a stroke



Scientists from Duke-NUS Medical School (Duke-NUS) in Singapore and their collaborators have come up with new methods to cultivate brain cells from stem cells to treat and study neurodegenerative diseases.

This novel technology forms the basis of two recent research projects under the newly established GK Goh Centre for Neuroscience (the GK Goh Centre) at Duke-NUS, offering hope for new treatments to patients suffering from neurological conditions such as Alzheimer's disease, ischaemic stroke and Parkinson's Disease.

In the first research project, scientists successfully grew neurons (nerve cells) from stem cells for transplantation into stroke patients to repair damaged brain tissue. The cells were cultivated on a chemical cocktail made up of Fibrinogen, a protein that helps with blood clotting; and Maraviroc, a drug used to treat infection.

This mixture protected the cells from inflammation when they were transplanted into the highly inflamed environment of a brain affected by ischaemic stroke. In preclinical trials, the cells not only survived, but successfully matured into the target neuron type and repaired the damaged brain over a period of 30 days.

The team has licensed the method and patent applications are underway for this technology, which has also proven successful in other neurodegenerative diseases, including Parkinson's disease.

Using the same technology, the team at the GK Goh Centre are also the first in the world to produce norepinephrine neurons-specialised nerve cells located in the brainstem, which connects with every part of the brain and spinal cord. The production of these cells will enable scientists to study why they are vulnerable and how their degeneration causes the diseases.