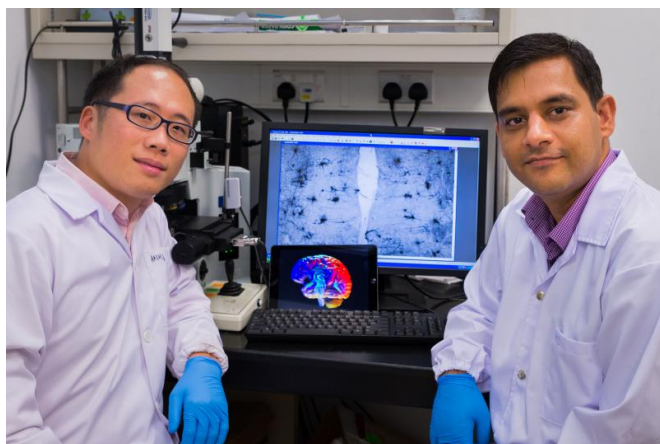


Scientists discover new treatment for dementia

6 April 2015



(from left) NTU scientists Dr Lee Wei Lim and Asst Prof Ajai Vyas discovers a new treatment for dementia by growing brain cells.

Pushing new frontiers in dementia research, Nanyang Technological University, Singapore (NTU Singapore) scientists have found a new way to treat dementia by sending electrical impulses to specific areas of the brain to enhance the growth of new brain cells.

Known as deep brain stimulation, it is a therapeutic procedure that is already used in some parts of the world to treat various neurological conditions such as tremors or Dystonia, which is characterised by involuntary muscle contractions and spasms.

NTU scientists have discovered that deep brain stimulation could also be used to enhance the growth of brain cells which mitigates the harmful effects of dementia-related conditions and improves short and long-term [memory](#).

Their research has shown that new brain cells, or neurons, can be formed by stimulating the front part of the brain which is involved in memory retention using minute amounts of electricity.

The increase in brain cells reduces anxiety and depression, and promotes improved learning, and boosts overall memory formation and retention.

The research findings open new opportunities for developing novel treatment solutions for patients suffering from [memory loss](#) due to dementia-related conditions such as Alzheimer's and even Parkinson's disease.

This discovery was published in eLife, a peer-reviewed open-access scientific journal published by the Howard Hughes Medical Institute, the Max Planck Society and the Wellcome Trust.

Assistant Professor Ajai Vyas from NTU's School of Biological Sciences said, "The findings from the research clearly show the potential of enhancing the growth of brain cells using deep [brain stimulation](#).

"Around 60 per cent of patients do not respond to regular anti-depressant treatments and our research opens new doors for more effective treatment options."

Dr Lim Lee Wei, an associate professor at Sunway University, Malaysia, who worked on the research project while he was a Lee Kuan Yew Research Fellow at NTU, said that [deep brain stimulation](#) brings multiple benefits.

"No negative effects have been reported in such prefrontal cortex stimulation in humans and studies have shown that stimulation also produces anti-depression effects and reduces anxiety.

"Memory loss in older people is not only a serious and widespread problem, but signifies a key symptom of dementia. At least one in 10 people aged 60 and above in Singapore suffer from dementia and this breakthrough could pave the way towards improved treatments for patients."

Growing new brain cells

For decades, scientists have been finding ways to generate brain cells to boost memory and learning, but more importantly, to also treat brain trauma and injury, and age-related diseases such as dementia.

As part of a natural cycle, brain cells constantly die and get replaced by new ones. The area of the brain responsible for generating new brain cells is known as the hippocampus, which is also involved in memory forming, organising and retention.

By stimulating the front part of the brain known as the prefrontal cortex, new [brain cells](#) are formed in the hippocampus although it had not been directly stimulated.

The research was conducted using middle-aged rats, where electrodes which sends out minute micro-electrical impulses were implanted in the brains. The rats underwent a few memory tests before and after stimulation, and displayed positive results in [memory retention](#), even after 24 hours.

"Extensive studies have shown that rats' brains and memory systems are very similar to humans," said Prof Ajai who is a recipient of NTU's prestigious Nanyang Assistant Professorship award.

"The electrodes are harmless to the rats, as they go on to live normally and fulfil their regular (adult) lifespan of around 22 months."

Provided by Nanyang Technological University

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