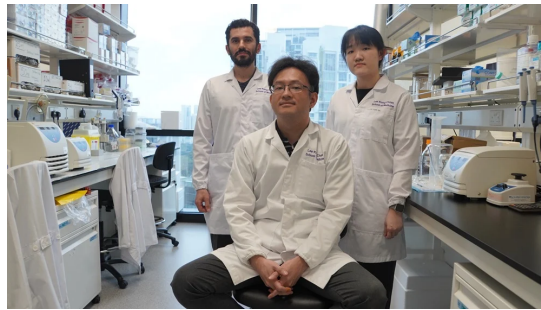


Ageing Impairs Brain Cells' Memory Maintenance Ability

Image: (L-R) Members of the NTU's LKCMedicine study include Research Fellow Dr Yadollah Ranjbar-Slamloo, Assistant Professor Tsukasa Kamigaki, Research Assistant Huee Ru Chong.

A team of scientists from NTU Singapore has demonstrated that communication among memory-coding neurons - nerve cells in the brain responsible for maintaining working memory - is disrupted with ageing and that this can begin in middle age.



Findings from the study, which was reported in Nature Communications, provide new insights into the ageing process of the human mind, and pave the way for therapies to maintain the mental well-being of an ageing individual.

Scientists have long studied the impact of ageing on the brain's executive functions, such as poorer self-control and working memory. While it is well established that memory can worsen as

people age, it has not been clear what changes occur at the individual brain neuron level to cause this - until now.

Previous studies used nerve cells from dead subjects, but the Lee Kong Chian School of Medicine (LKCMedicine) team measured the real-time activity of individual nerve cells in live mice. To make these measurements, the team adopted a recently unveiled optical imaging technique that allowed them to understand the function of each neuron by measuring its neural activity in the context of working memory.

In lab experiments, the NTU scientists investigated how neurons in mice of three different age groups - young, middle age, and old age - responded to tasks that required memory.

The researchers showed that compared to young mice, middle-aged and old mice required more training sessions to learn new tasks, indicating some decline in memory and learning abilities from middle age. But beyond that, they also found changes in the nerve cells of older mice.