

Mental and physical exercise delays dementia in fatal genetic disease

January 24 2008

Scientists at Melbourne's Howard Florey Institute have discovered that mental and physical stimulation delays the onset of dementia in the fatal genetic disease, Huntington's disease.

This Australian research opens up new therapeutic possibilities for other devastating and difficult to treat brain diseases, including Alzheimer's disease where dementia is a key component.

The Florey's Dr Jess Nithianantharajah and Dr Anthony Hannan showed mice with the Huntington's disease gene displayed impairments on learning and memory tests at an early stage of the disease, prior to the obvious signs of movement problems. This closely correlates with observations in Huntington's disease patients.

However, Dr Jess Nithianantharajah said by providing the mice with an enriched environment that enhanced their mental and physical stimulation, the mice performed better on these memory tests.

"This discovery is quite remarkable because we have shown that an enriched environment not only delayed the onset of dementia, but it also slowed the progression of memory loss in these mice," Dr Jess Nithianantharajah said.

"We also showed that in the Huntington's disease mice, specific molecular changes occur that relate to communication between brain cells (synapses) in a region of the brain called the hippocampus, which

plays a significant role in the formation of memories.

“The Huntington’s disease mice without increased mental and physical activity showed decreased levels of specific proteins that are expressed at the synapse, which are essential for normal brain function.

“But the Huntington’s disease mice exposed to increased mental and physical activity did not show this decrease,” she said.

Huntington’s is a very powerful model for nature-versus-nurture investigations. This discovery implies that gene-environment interactions and how they affect changes in the brain’s pathways is important for all brain diseases.

Treatments for complex psychiatric disorders, like depression and schizophrenia, may also benefit from these research efforts.

Source: Research Australia

Citation: Mental and physical exercise delays dementia in fatal genetic disease (2008, January 24) retrieved 24 April 2024 from <https://medicalxpress.com/news/2008-01-mental-physical-dementia-fatal-genetic.html>

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