Research identifies novel steps in dementia progression

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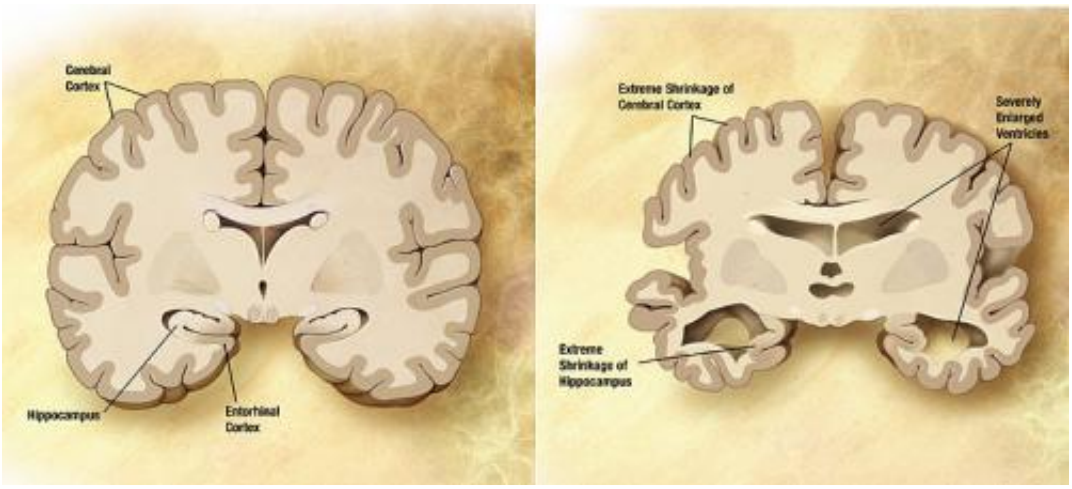

Diagram of the brain of a person with Alzheimer's Disease. Credit: Wikipedia/public domain.

Research by biologists at the University of York has identified new mechanisms potentially driving progression of an aggressive form of dementia.

The research, which was funded by Alzheimer's Society and the Biotechnology and Biological Sciences Research Council (BBSRC), is published today in *The Journal of Cell Biology*.

Working with scientists at the University of Massachusetts Medical School and University of Puerto Rico, the researchers studied how

synapses - the connections between neurons - are affected by changes in the protein CHMP2B that are linked to Frontotemporal Dementia. They uncovered mechanisms that controlled growth in synapses causing them to overgrow. These signals are normally involved in immune reactions and have not been seen to function in synapse growth previously.

Frontotemporal Dementia is one of the most common forms of early onset dementia that typically starts in individuals in their fifties. It affects the ability to use and understand language in addition to a change in personality and a loss of inhibition in some social behaviours. This is caused by the loss of neurons in the frontal and temporal lobes of the brain.

Initial laboratory research into the effects of CHMP2B was carried out using Drosophila, a species of fruit fly, and findings were confirmed in mammalian neurons. This work identifies novel steps in disease progression that could potentially be targeted by drugs to halt cognitive decline.

The senior author Dr Sean Sweeney, of the Department of Biology, University of York, said: "These findings shed light on the events occurring in neurons as dementia takes hold. The more we know about the steps that occur in disease progression, the more opportunities we have to intervene with potential therapies."

The lead author, Dr Ryan West added: "We hope that this work helps to tease apart complex molecular processes occurring in neurons and identify how these can go wrong in neurodegenerative diseases, such as Frontotemporal Dementia."

Dr Clare Walton, Research Manager at Alzheimer's Society said: "We know less about the underlying causes of frontotemporal dementia than some other kinds of dementia so research like this is a vital step towards

developing treatments for the condition. Further research will be needed to determine whether this mechanism plays a similar role in humans.

"Alzheimer's Society is dedicated to supporting and training new scientific talent like Ryan to generate novel research ideas that will help us find the answers to all types of dementia."

Provided by University of York