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QBI neuroscientists make Alzheimer's disease advance

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Queensland Brain Institute (QBI) neuroscientists at UQ have discovered a new way to reduce neuronal loss in the brain of a person with Alzheimer's disease. Memory loss in people with Alzheimer's disease can be attributed to several factors.

These include a build-up of the neuro-toxin Amyloid beta – the major component of amyloid plaques found in patients with Alzheimer's – and corresponding degeneration of a specific population of nerve cells in the basal forebrain.

QBI neuroscientist Dr Elizabeth Coulson's research was recently published in the *Journal of Neuroscience*.

She said the research had established that the molecule known as p75 neurotrophin receptor was necessary for the Amyloid beta to cause nerve cell degeneration in the basal forebrain.

During her research, Dr Coulson's team found – both in cultured cells and in an animal model of Alzheimer's disease – that it was possible to completely prevent Amyloid beta toxicity by removing the p75 cell death receptor.

"Discovering how Amyloid beta triggers neuronal degeneration has been a question bugging neuroscientists for decades, and we have identified an important piece of the puzzle," Dr Coulson said.

These results provide a novel mechanism to explain the early and characteristic loss of brain cells that occurs in Alzheimer's disease – which are known to be important for memory formation.

Dr Coulson already has patented molecules that can block p75 and is ready to begin testing them in animal models of Alzheimer's disease.

"If such therapy is successful, it probably wouldn't cure this multifaceted disease," Dr Coulson said.

"But it would be a significant improvement on what is currently available for Alzheimer's disease patients."

The World Health Organisation predicts that by 2040, neurodegenerative conditions will become the world's leading cause of death, overtaking cancer.

Alzheimer's disease is the most common dementia affecting 10 per cent of people over 65 and 40 per cent over 80 years of age.

Significant advances in determining the molecular regulation of nerve cell function and survival have major impact on our understanding of more complex areas such as behaviour, cognition, aging and neurological diseases.

Source: Research Australia