

Prion protein hints at role in aiding learning and memory

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Scientists from the University of Leeds have found that the protein called prion helps our brains to absorb zinc, which is believed to be crucial to our ability to learn and the wellbeing of our memory.

The findings published today in *Nature Communications* show that prion protein regulates the amount of [zinc](#) in the brain by helping cells absorb it through channels in the [cell surface](#). It is already known that high levels of zinc between [brain cells](#) are linked with diseases such as Alzheimer's and Parkinson's.

Professor Nigel Hooper from the University's Faculty of [Biological Sciences](#) explains: "With ageing, the level of prion protein in our brains falls and less zinc is absorbed by brain cells, which could explain why our memory and learning capabilities change as we get older. By studying both their roles in the body, we hope to uncover exactly how prion and zinc affect memory and learning. This could help us better understand how to maintain healthy brain cells and limit the effects of ageing on the brain."

Whilst the abnormal infectious form of prion - which causes Creutzfeldt-Jakob disease (CJD) in humans and [bovine spongiform encephalopathy](#) (BSE) in cattle - has been extensively studied, the Leeds team is among the first to investigate the role of the 'normal' form of the protein.

Lead researcher, Dr Nicole Watts, says: "Zinc is thought to aid signalling in the brain as it's released into the space between brain cells. However,

when there's too much zinc between the brain cells it can become toxic. High levels of zinc in this area between the [brain](#) cells are known to be a factor in neurodegenerative diseases, so regulating the amount of absorption by the cells is crucial."

The research, funded by the Medical Research Council, Wellcome Trust and Alzheimer's Research UK, may have implications for how we treat – and possibly prevent – [neurodegenerative diseases](#) in the future.

Dr Simon Ridley, Head of Research at Alzheimer's Research UK, said: "We're pleased to have helped support this study, which has uncovered new information that could one day aid the development of new treatments for Alzheimer's. One next step would be to understand how regulating zinc levels may affect the progress of the disease. Results like these have the potential to lead to new and effective treatments – but for that to happen, we must build on these results and continue investing in research."

More information: Prion protein facilitates uptake of zinc into neuronal cells, Nicole T. Watt, David R. Taylor, Talitha L. Kerrigan, Heledd H. Griffiths, Jo V. Rushworth, Isobel J. Whitehouse, and Nigel M. Hooper, *Nature Communications*, [DOI: 10.1038/ncomms2135](https://doi.org/10.1038/ncomms2135)

Provided by University of Leeds

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