Neuronal network disruptions in a model of tauopathy

https://neurodegenerationresearch.eu/survey/neuronal-network-disruptions-in-a-model-of-tauopathy/

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Funder

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United Kingdom

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Neuronal network disruptions in a model of tauopathy

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The project/programme is most relevant to:

Alzheimer's disease & other dementias

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Research Abstract

Neurones in the brain are interconnected within complex networks, the electrical behaviour of which determines how we think and behave. In dementia sufferers these networks do not

function correctly, contributing to the well-known memory problems associated with diseases like Alzheimer’s.

The nature of the electrical activity in these networks is determined by multiple factors, including the strength of connection between nerve cells (synapses) and the intrinsic electrical properties of individual cells. In an initial study of a mouse which overproduces the tau protein (rTg4510 mice) we identified changes in the electrical and synaptic properties of cells in hippocampus and prefrontal cortex, brain regions crucial for learning and memory. These findings suggest these two brain regions communicate abnormally in diseases associated with excessive tau production.

I propose to study the behaviour of these networks in normal and rTg4510 mice, using state-of-the-art recording devices which monitor the activity of individual cells and groups of cells. This will allow us to monitor the ‘brain waves’ (similar to EEG recordings) of these mice whilst they perform certain behavioural tasks which involve the hippocampus and prefrontal cortex. Understanding how neuronal networks malfunction in disease models will ultimately provide novel approaches for treating dementia.

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