Investigating the role of kinesin motor proteins in a human neuronal cell model of Alzheimer’s Disease: a new drug discovery target?

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Investigating the role of kinesin motor proteins in a human neuronal cell model of Alzheimer’s Disease: a new drug discovery target?

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2

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Research Abstract

Alzheimer’s Disease (AD) is the leading cause of dementia and for which there is currently no known cure. AD is associated with the presence of deposits of amyloid (A?) and tangles (tau) in the brain. Defects in transport by kinesins (the molecular motors of the cells) are a major cause of tau-related neurodegeneration. We have found that kinesin-1 and kinesin-3, the major neuronal transporters, are required for neuronal survival in Drosophila. Using a Drosophila

model of AD, which replicates many features of the disease including neuronal dysfunction and premature death, we have shown that increased levels of these kinesins in neurons result in improved neuronal function. In the proposed pilot study, we aim to test the role of kinesins in a neuronal cell model derived from familial AD patients. We will test: i) whether kinesins are required for human neuronal survival; ii) whether increased kinesin levels improve human neuronal survival and; iii) whether increased kinesin levels reduce tau and A? toxicity. Ultimately, we aim to validate kinesins as a potential drug target for AD and make progress in understanding the relationship between A? and tau pathology.

Further information available at:

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Investments < €500k

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