Investigating the effect of ApoE genotype on synaptic dysfunction using sporadic Alzheimer’s disease patient iPSC-derived cells

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Country

United Kingdom

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Investigating the effect of ApoE genotype on synaptic dysfunction using sporadic Alzheimer’s disease patient iPSC-derived cells

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3

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Research Abstract

The majority of Alzheimer’s disease (AD) is sporadic, however the presence of a gene encoding the E4 form of apolipoprotein E (ApoE) has been associated with increased risk of developing the disease. ApoE is primarily produced by astrocytes, which are the supporting cells of the brain and play important roles in regulating how nerve cells (neurons) communicate with one another. A key feature of AD is that the communication between neurons at synaptic

connections stops functioning properly. In this project we will take advantage of the latest stem cell technologies to generate both neurons and astrocytes from AD patients with the ApoE4 gene. This will establish a new model of the disease in which we can systematically examine how ApoE affects different aspects of synaptic communication. We will assess how ApoE affects the ability of neurons to form functional synapses and the potential for synapses to undergo changes in strength – a cellular basis of memory that is believed to be compromised in the early stages of AD. Finally, this approach will enable us to test whether synaptic impairments can be prevented by growing patient neurons with astrocytes from healthy individuals.

Further information available at:

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