Analysis of mitophagy in neural stem cells carrying Parkinson’s disease associated mutations in LRRK2.

https://neurodegenerationresearch.eu/survey/analysis-of-mitophagy-in-neural-stem-cells-carrying-parkinsons-disease-associated-mutations-in-lrrk2/

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Research Abstract

Neurodegenerative disorders including Alzheimer?s disease (AD) and Parkinson disease (PD) are becoming an increasing burden in the aging societies of the European Union. Neuronal degeneration in both diseases is accompanied by altered autophagy and mitochondrial dysfunction among other symptoms, yet the underlying pathological significance of these phenomena is not completely understood. Recent biotechnological advances have paved the

way to the use of stem cells as a cellular source that: i) effectively models neurodegenerative diseases in vitro and ii) allows the development of novel therapeutic strategies aiming on neuroprotection or replacement of degenerated cells. In the proposed project, we will investigate the role of autophagy and mitochondrial deregulation in neural stem cell function during maintenance and neuronal differentiation. Genetic studies have identified mutations in the LRRK2 gene to segregate not only with the rare familial forms of the disease but also with the more common sporadic PD cases. By using neural stem cells carrying mutations in LRRK2 preliminary results obtained in the host lab indicate that indeed mitophagy is affected in these cells. In the here proposed project we aim on analyzing mitophagy in neural stem cells derived from PD patient specific induced pluripotent stem cells with mutations in LRRK2. Furthermore, we will analyze how deregulated mitophagy influences the redox state and certain cellular characteristics (survival, stem cell maintenance and neuronal differentiation) of neural stem cells. Understanding this process in PD-specific neural stem cells might disclose new therapeutic strategies to treat PD-associated non-motor symptoms.

Further information available at:

https://www.fnr.lu/projects/analysis-of-mitophagy-in-neural-stem-cells-carrying-parkinsons-disease-associated-mutations-in-lrrk2-2/

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