

Deciphering the role and importance of altered glycosylations in neurodegenerative and neurometabolic diseases

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Principal Investigators

Göran Larson

Institution

University of Gothenburg

Contact information of lead PI

Country

Sweden

Title of project or programme

Deciphering the role and importance of altered glycosylations in neurodegenerative and neurometabolic diseases

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01/01/2014

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4

Keywords

Research Abstract

This project aims at clarifying the role of altered glycosylations of glycolipids, glycoproteins and proteoglycans, in relation to the pathophysiology of Alzheimer's disease (AD), Congenital Disorders of Glycosylation (CDGs) and Lysosomal Storage Diseases (LSDs). Seemingly different these disorders all affect neuronal and mental functions, directly involve specific glycoconjugates and are presently without cure and progressively debilitating for the affected

patients and their families. We intend to establish induced pluripotent stem cells (iPSC) from these patients, and their close relatives, in order to obtain both pluripotent and mature differentiated cells, all with a genetically well-defined background, for cellular studies of protein and lipid aggregates otherwise elusive for studies unless in animal models. The molecular biological and structural characterization of these cells will be an extension of our earlier successful work on glycan biosynthesis and mapping of glycoprotein micro-heterogeneity but now also adding structural characterization of proteoglycans in reprogrammed and differentiated cells. For proof of concept studies and the advancement of future therapy the iPSC will be used for genetic engineering through the Zinc finger nuclease or TALEN techniques to deliberately induce or correct for inherited alterations in critical glycan pathways. Also, differentiated cells will be used for testing exogenous drugs for enhanced expression of mutated enzymes.

Further information available at:

Types:

Investments < €500k

Member States:

Sweden

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N/A

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2016

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