Using zebrafish to study myelinated axons in vivo.

https://neurodegenerationresearch.eu/survey/using-zebrafish-to-study-myelinated-axons-in-vivo/

Name of Fellow

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Institution
Funder

Wellcome Trust

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Country

United Kingdom

Title of project/programme

Using zebrafish to study myelinated axons in vivo.

Source of funding information

Wellcome Trust

Total sum awarded (Euro)

€ 2,617,503

Start date of award

01/02/14

Total duration of award in years

5.0

The project/programme is most relevant to:

Neurodegenerative disease in general

Keywords

Motor Neuron | Neurodegen | Parkinson

Research Abstract

The goal of my proposal is to elucidate how oligodendrocytes myelinate axons in the central nervous system (CNS) in vivo. Addressing this question is important because of the key

functions of myelin. Myelin is essential for rapid nerve conduction. Myelinating oligodendrocytes provide metabolic support to axons that maintains their long-term health. Myelination continues throughout life, may be regulated by neuronal activity, and can affect learning and memory. Disruption to CNS myelin contribute s to numerous conditions, including the demyelinating neurodegenerative disease multiple sclerosis, motor neuron disease (until recently thought to primarily result from neuronal defects) and psychiatric conditions such as schizophrenia. Despite the importance of myelin during development and throughout life, there are major gaps in our knowledge of axon-oligodendrocyte interactions during myelination in the living animal. This is partly due to the fact that myelination commences around birth i n rodent models when the CNS is inaccessible, complex and largely impervious to in vivo analyses. My group uses zebrafish to study myelinated axons because of their suitability for high-resolution imaging in the living animal and their amenability for large-scale genetic and chemical discovery screens. With an SRF I will use transgenic reporters that we have generated in recent years to determine how oligodendrocytes and axons interact in vivo, and also carry out new screens to identify the c urrently unknown associated signals that regulate CNS myelination. This work will provide mechanistic insights into CNS formation and function, and may identify new molecular targets and compounds relevant to future therapeutic strategies.

Types:
Fellowships

Member States:
United Kingdom

Diseases:
Neurodegenerative disease in general

Years:
2016

Database Categories:
N/A

Database Tags:
N/A