In vivo models of disease and toxicity in the nervous system

https://neurodegenerationresearch.eu/survey/in-vivo-models-of-disease-and-toxicity-in-the-nervous-system/

Title of project or programme

In vivo models of disease and toxicity in the nervous system

Principal Investigators of project/programme grant

Title	Forname	Surname	Institution	Country
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Address of institution of lead PI

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- United Kingdom

Source of funding information

Medical Research Council

Total sum awarded (Euro)

1673056.14

Start date of award

01-04-2008

Total duration of award in months

24

The project/programme is most relevant to

- Prion disease
- Neurodegenerative disease in general

Keywords

Research abstract in English

Neurodegenerative diseases, such as Alzheimer’s, Parkinson’s, Huntington’s disease and amyotrophic lateral sclerosis, have enormous clinical and economic impact world wide. Irrespective of

the final pattern of clinical symptoms, they all are caused by an irreversible loss of neurons, which cannot be cured. But before neuronal death, there are neuronal dysfunction and synaptic impairment, which potentially can be treated.

My background is in prion diseases, modelling these in transgenic mice to look at mechanisms of neurotoxicity and developing new therapeutic approaches. In particular, I focused on the changes of early prion neurotoxicity and recovery from it. This new programme uses mouse models to understand the early molecular events in prion and other neurodegenerative diseases, looking in parallel at potential therapeutic targets for prevention of neuronal dysfunction and death.

Our main aims are to:

1. Characterise pre-degenerative neuronal changes.

2. Understand what triggers ultimate commitment to death in a malfunctioning neuron.

3. Define the molecular targets and the temporal window for functional recovery.

Initially, these questions will be addressed using our established mouse model of prion disease where early pathology is associated with a pivotal point in neuronal survival/death, and there is potential for recovery. We will use molecular biological, biochemical and neurophysiological techniques, as well as neuronal imaging in culture and in vivo to characterise the underlying cellular and synaptic changes, including alterations in signalling pathways and ion channels.

The broader aims of the programme are:

4. to generate new mouse models to look at individual pathways implicated in early dysfunction and their effect on neuronal function and death.

5. to address therapeutic strategies for the treatment of neurodegeneration.

Lay Summary