

Projects Available in the Laboratory of Sensory and Motor Systems

Investigating a possible cause of Parkinson's Disease

One of the primary focuses of the laboratory is to investigate possible causes of Parkinson's Disease, a debilitating condition which affects 1% of people over the age of 65. Despite being described over 190 years ago, the cause of the condition is still not known. This project aims to evaluate a possible cause of Parkinson's Disease by investigating the symptoms and neural changes that occur as a result of insults to specific cell types in the CNS. In addition, the project will include an investigation into a possible blood test for the beginning stages of Parkinson's Disease, which if successful will provide an earlier diagnostic blood test than anything currently existing.

The results obtained from this project will provide important information into the underlying pathology of Parkinson's Disease specifically from the point of view of identifying an initiating trigger for the cascade of events that lead to the disease. If the mechanisms modeled are successful the blood test developed from the work will possibly provide a means of quickly and easily screening at-risk patients right at the beginning the disease, when preventative therapy may still be possible.

Anticipated papers arising from this project

1. Development of a new animal model of Parkinson's Disease (1st Author)
2. Development of an early blood test for detecting the initiation of Parkinson's Disease (1st Author)

Research Plan

Study #1

Number of rats used in study #1

	No lesion	2 Days	5 Days	10 Days	20 Days
Vehicle	5	5	5	5	10
Toxin		10	10	10	10
6-OHDA		10	10	10	10

The new model of Parkinson's Disease will be examined at a number of time points following injury to investigate the development of neurodegeneration consistent with that observed in the human condition. Both the behavioural symptoms and the cellular pathology that results from the insult will be examined in this study. The new model will also be compared with the standard 6-hydroxydopamine model of Parkinson's Disease, which will act as a positive control for the neuronal degeneration and the resulting behaviours. Loss of dopamine producing neurons will be examined as well as changes in glial cells, the number of apoptotic cells and changes in metabolic rate of cells in the basal ganglia and related parts of the brain.

The blood test will be developed by utilizing a detection assay called an Enzyme Linked ImmunoSorbant Assay (ELISA) which looks for specific proteins in the blood that are hopefully characteristic of the condition being examined.

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