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Developing novel models for motor neuron disease

Name of Supervisor: Shyuan Ngo

Short one paragraph abstract: In motor neuron disease (MND), dysfunction in a range of cellular processes are proposed to contribute to the death of motor neurons. While these cellular processes have been studied under a largely motor neuron-centric lens, it is important to recognise that these defective pathways are also observed in other cell types including macroglia (astrocytes and oligodendrocytes) and microglia. However, the sequence of events through which astrocytes, oligodendrocytes, and microglia contribute to the death of motor neurons remains to be resolved. In this project, we aim to use induced pluripotent stem cells obtained from MND patients to generate novel disease models so that they can be used to study the molecular processes within, and between neurons and glial cells that might drive the degeneration of motor neurons.

Name of Honours Project: Energy dynamics in health and disease

Name of Supervisor: Shyuan Ngo

Short one paragraph abstract: In motor neuron disease (MND), alterations in a range of metabolic processes are proposed to contribute to more rapid disease progression and earlier death. To improve outcomes for people living with neurodegenerative diseases, we must first identify the mechanisms that regulate optimal metabolic health, and how dysregulation in these process contribute to disease. In this project, we will use a range of mouse and cell models to gain mechanistic insights into the control of metabolic homeostasis, with the view to identify metabolically directed treatment strategies for neurodegenerative diseases.