

Genetics Honours Project in Simon Koblar's Laboratory

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Predicting the potential for neuronal differentiation of stem cells isolated from dental pulp.

Tissue contained within the tooth contributes to the maintenance of tooth health. Known as dental pulp this tissue is thought to originate from migrating neural crest cells during development. We have isolated primary cultures of dental pulp stem cells (DPSCs), which are known to contain mesenchymal stem cells. These primary cultures display a heterogeneous range of morphologies and under specific *in vitro* culture methods we have differentiated DPSCs into neurons, osteoblasts, chondroblasts and adipocytes.

The aim of this project is to determine the gene expression profiles of the DPSCs and sub-populations of neural progenitor cells. There are a number of known neuronal progenitor cell genetic markers described in other tissues. This project will determine neural progenitor gene profiles of DPSCs. Based on the expression profiles discovered specific markers could then be used to enrich sub-populations of cells, which could improve the efficacy of their therapeutic use.

DPSC transplantation has been shown to have significant benefits following various tissue injuries. Further understanding of these cells and the mechanisms involved in therapeutic context will be of great interest to the field.