

In the summer of 2024, I completed a BPS-funded summer research project under the supervision of Prof. Eilis Dowd on the topic: "Harnessing Biomaterials for Brain Repair in Parkinson's Disease". I was first introduced to Prof. Dowd as my lecturer for a Neuropharmacology module and was fascinated by both the topic and her personal research in this area. Prof. Dowd's current research focuses on improving viability and maturation of transplanted stem cell-derived neuronal precursors. To achieve this, her team tests different biomaterials to determine their effects on the survival, maturation and overall efficacy of the grafts in 6-OHDA-lesioned rats. The particular study I was involved in examined the use of neurotrophin-loaded cryogel spheres to deliver neurotrophic factors BDNF and GDNF to the transplant site. During my project I was under the supervision of Prof. Dowd's PhD students Tommy Patton, Saoirse Ryan and Sarah Crudden.

The main assay I performed was an immunohistochemical assay, staining rat brain slices for GDNF. After staining I fixed the tissue on slides and used a microscope to examine them and capture images, which I later analysed for optical density of GDNF. I also had the opportunity to gain experience in other techniques, namely culture of SH-SY5Y cells and Western blot analysis of the same. I assisted a PhD student in the lab with optimising a Western blot protocol for analysing levels of alpha-synuclein in cells.

Doing this project allowed me an understanding of the day-to-day work that goes on in a neuroscience lab, and how in vivo experiments are completed from start to finish. This experience also gave me a unique insight into the trial-and-error that is such an important part of scientific research. Through performing multiple Western blots, we were able to troubleshoot the protocol and optimise an experimental design for future studies. Ultimately, I was able to present the data I gathered during this project at the Galway Neuroscience Centre Research Day in December 2024, which was a really valuable experience for me.

Overall, my BPS summer project greatly benefitted me as a developing researcher, both in terms of developing practical lab skills and gaining a better understanding of how academic research works. I am pleased to be able to say I am now a PhD student in Prof. Dowd's lab, owing in part to BPS for allowing me the opportunity to gain research experience.