Imperial College London

A UROP perspective by Lucia Hughes

Summer 2022 (undertaken in the Department of Chemistry)

Lucia was a Year 2 undergraduate at Imperial College London in 2021-2022: MSci Chemistry with French for Science, Department of Chemistry

UROP title: Understanding the role of N-terminal acetylation in α-Synuclein aggregation

I was made aware of the Undergraduate Research Opportunities Programme by my department. I immediately knew that this was something that would interest me, as I believed it to be an opportunity to improve my lab skills and my confidence in the lab, as well as giving me the chance to experience how scientific research is carried out.

In order to secure my UROP research experience (and I was most interested in finding an opportunity within my own department), I began by looking at the research themes of the department, and the profiles of academics within the department. I then noted down the ones that I found the most interesting and began emailing them to ask whether they had any UROP opportunities available for the summer. I also included why I was interested in their research, and what my motivations were. I eventually heard back from Dr Francesco Aprile, with whom I had a chat about the project and my interests before he offered me a research experience. This was extremely useful to me as it allowed me to express the fact that I was more interested in the Physical Chemistry and fluorescence imaging side of his research, compared to the Organic Chemistry and synthesis side, which meant that the project I did fed into my interests more.

Although protein aggregation was not something I had studied before, in one of the Measurement Science labs in my second year we had measured various aspects of protein folding using fluorescence spectroscopy, so I did not feel completely out of my depth when starting the project. In addition to this I was sent some key papers to read, which allowed me to familiarise myself with the main aspects of my project, such as the aggregation kinetics of different a-synuclein variants, the interaction of lipids with a-synuclein, and liquid-liquid phase separation. As a result, I felt more comfortable and confident when I got into the lab, however it was common for me to be asking lots of questions!

Throughout my UROP I gained many new skills that I would not have gained in an undergraduate lab, for example using machines such as an AKTA for protein purification, and Circular Dichroism to determine the morphology of the protein monomers and fibrils. I also learnt many new techniques such as SDS-PAGE, Dot blots, and PCR. However, I think that the most valuable lessons have been the importance of recording everything you do; how to work with a budget; and how to collaborate and work together as a group. The Aprile group was extremely welcoming and friendly, and it is made up entirely of female researchers, which was a very welcome difference to the environments I have experienced so far.

Overall, this UROP has been an invaluable experience, and the skills and confidence I have gained will stay with me throughout my scientific career. I hope to complete a PhD in the future and would like this to be in a similar field to that of my UROP project.

I would definitely recommend doing a UROP to anyone that is interested!