Research Summary. Intrinsically disordered proteins are biomolecules lacking a single, rigid three-dimensional structure and instead rapidly interconvert between many distinct states (**Figure 1**). These proteins are highly prevalent in diseases such as dementia, cancer, and those caused by viruses, yet surprisingly little is known about their structures and functions due to their conformational heterogeneity, which makes them challenging to study. My research combines computation and experiment to characterise the complex roles of disordered proteins in disease and their potential druggabilities at the atomic level. I answer these questions using a wide range of biophysical techniques including molecular dynamics simulations and nuclear magnetic resonance spectroscopy.

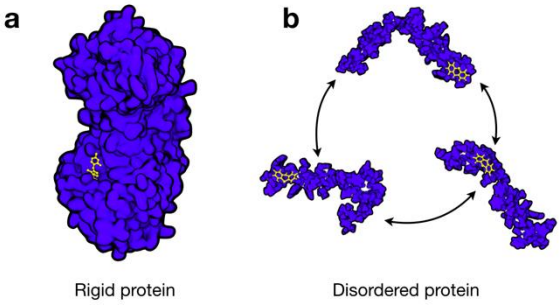

Figure 1. *(a) A folded protein exhibits deep, well-defined grooves which can act as binding sites for small molecules (yellow). (b) A disordered protein rapidly interconverts between states and generally has no binding sites that resemble those in folded proteins.*

Academic Year 2019/2020. I began as the Rosalind Franklin Research Fellow in July 2019, where I explored new techniques to probe the druggability of disordered proteins involved in disease. My work was published in *Proceedings of the National Academy of Sciences* and *Nature Methods*. Furthermore, in Sept. 2019, I submitted my PhD Thesis entitled '*Small Molecule Binding to Disordered Proteins'*, which I defended in Nov. 2019. Additionally, I was awarded a supercomputer access grant and the Schmidt Science Fellowship (see below).

Academic Year 2020/2021 (to date). During the Academic Year 2020/2021, I published a key first-author paper in *Science Advances* based on work as the Rosalind Franklin Research Fellow and as a PhD student, describing a new mechanism by which a drug-like molecule can interact with a disordered protein in Alzheimer's disease, demonstrating the druggability of disordered proteins (https://www.ch.cam.ac.uk/news/targeting-shape-shifting-undruggable-protein-alzheimers-disease). I also published three co-author papers on related topics in *Proceedings of the National Academy of Sciences*, *Nature Computational Science*, and *Scientific Reports*. Furthermore, my research focus shifted from disordered proteins involved in neurodegeneration to those involved in viruses.

In October 2020, I temporarily paused my Rosalind Franklin Research Fellowship to begin as a Schmidt Science Fellow to gain new skills in a technique called Nuclear Magnetic Resonance Spectroscopy, which is essential for my research program. I am hosted in the laboratory of Prof. D Flemming Hansen in the Dept. of Structural & Molecular Biology at University College London (UCL), a world-leading expert in the field. I also began a new collaboration with Prof. Greg Towers in the Dept. of Infection & Immunity at UCL, an expert in virus-host interactions.

This year I was also invited to present my research at several international conferences, including a Keynote Lecture at the University of Melbourne. Furthermore, I received three supercomputer access grants for my research.

Non-research activities. In addition to my research, I have also been engaged in science communication, outreach, and teaching. In particular, continued my work of contributing to Wikipedia to celebrate the achievements of underrepresented scientists. Additionally, I served as a judge for Newnham's Biological Sciences Essay Prize for Y12 school girls. Lastly, I have also served as a day-to-day supervisor for Part III students.

I am very grateful to Newnham College for their continued support of my research and for the invaluable connections (both in person and virtual) that I have made with other senior members and staff. I am also very thankful to Anne Thomson, the College Archivist, for sharing with me several letters that Rosalind Franklin wrote home to her family when she was a Newnham student.