

To whom it may concern,

My name is [REDACTED], I am a [REDACTED] graduate (MSci Chemistry with Industrial Experience), and I am applying for the SABS:R3 CDT. I would be honoured to be a part of the prestigious history at Oxford University, and I am extremely excited to operate at the interface between the computational and life sciences. I have consistently worked to a high standard in my scientific career and my range of experiences up to this point has allowed me to feel confident that a PhD is right for the next stage of my development. My interests are broad and varied but the idea of developing an understanding of biological systems through a combination of theoretical and practical techniques truly resonates with me.

In my master's project under [REDACTED], a previous dynamic atomistic-MD study on a nicotinic acetylcholine receptor was replicated in a coarse-grained (CG) forcefield (MARTINI). One challenge at the biological interface is the sheer complexity of these systems. The CG approach enabled a larger temporal landscape to be sampled than the original study. Extended through a research internship, I developed a knowledge-based framework to tune the elastic network. Using this approach, the dynamical pathway for signal propagation of ligand unbinding predicted from structural studies was recovered. This novel study aims to publish the results of observed non-equilibrium CG signal propagation (manuscript in progress). To complete this study, I worked beyond my original research contract and have juggled writing the paper alongside full-time renovation work and now a financial modelling internship whilst enduring caring responsibilities for my mother. Additionally in this project, I carried out atomistic-MD in Virtual Reality (iMD-VR) of the same receptor to assay the model in real-time; qualitatively but visually demonstrating key interactions with residues known from mutant studies to be required for channel gating. y

My industrial placement at [REDACTED] allowed me to develop my scientific abilities under pressure, from experimental to report writing, as my work was often involved in submissions to regulatory bodies. Outside of performing routine analyses and method development in my day-to-day work, I conducted a project into modelling the dissolution performance of a drug with [REDACTED]. This work aimed to recreate the range of *in-vitro* paediatric conditions *in-silico*; careful consideration of the parametrisation was essential due to the limited data available on paediatric systems.

At conferences during my placement, I saw the gradual shift within the industry to target larger molecules taking cues from nature. I believe that bioinspiration through computation is the next frontier for science and are key to solving the largest problems to face humanity from antimicrobial resistance to climate change. For these reasons, I am highly interested in the opportunities the programme provides, particularly the theme of Computational & Data-Driven Structural Approaches to Drug Discovery. I have demonstrated my competence in biophysics through my work so far and I am committed to pushing my skills further using novel computational approaches in biology and medicine to the top level.

As a care leaver and now young carer, I am driven and have demonstrated my resilience with my achievements gained under exceptional circumstances. I have an enduring desire to learn, education has been pivotal in my life and so in addition to being involved in cutting edge research it is a dream of mine to contribute back to society, both in the lab and the classroom. I have tutored and supervised throughout university and school. Mentoring younger students, running tutorials and experiments allowed me to share my love of science to inspire younger students which I found very rewarding.

During my placement and continued in my final year I setup and ran a keynote practice group to develop mine and my peer's science communication skills into an area of personal strength. I have represented the university for sport, and I have had multiple positions on club committees. I feed my curiosity with lectures and virtual seminars as well as personal projects including programming, creative photography, and home renovations. I feed this all back into my work and I feel this is what allows me to truly stretch my wings. I am strongly interested in expanding my extracurricular gamut through outreach and involvement in faculty or club committees during my PhD.

I am available for interview at your convenience and look forward to hearing from you.

Yours faithfully,

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