

A UROP perspective by Ivan Titarenko

Summer 2025 (undertaken in the Department of Bioengineering, Imperial College London)

Ivan was a 2nd year undergraduate at Imperial College London in 2024-25: MEng Biomedical Engineering, Department of Bioengineering

UROP title: Study of primary and secondary blast injuries in children

An undergraduate research experience (UROP) was strongly recommended to me by both Imperial's Careers Service, and by other members of my cohort within my undergraduate degree programme. At the time, I was focused on pursuing experience in industry in the form of summer internships, however with most companies requiring penultimate year students, opportunities were limited, so after some time I decided to focus on my UROP application.

The Bioengineering department had a significant number of academics conducting research in interesting fields, however I was particularly interested in Professor Anthony Bull's recent work, focused on blast injuries and biomechanics. After a few months, I was contacted by members of his research group (Sumudith Jayasuriya and Alba Morillo Paterson), who were open to having me on-board as a UROP student. They suggested a project involving a significant amount of hands-on lab experience and computational fluid dynamics work, which was something of great interest to me, so I happily accepted their project offer.

During my 10-week UROP experience, my project was split into two sections, each being overseen by one of my supervisors. I investigated alterations in blast wave profile caused by shock tube setup modifications, as part of research looking into primary blast injuries, and how primary blast waves can lead to growth plate disruption. I also investigated the aerodynamics of irregular-shaped fragments which are commonly found in secondary blast injuries. I had the opportunity to assist with the operation of pneumatically driven blast injury simulators, as well as preparation of samples and bone tissue work. Furthermore, I gained experience working with Computer-Aided Design Software, Computational Fluid Dynamics Software, and Medical Imaging Software, all of which will be invaluable for future work within the field.

The highlight of my UROP was interacting and working with members of Professor Anthony Bull's research group, mostly importantly my supervisors Sumudith and Alba. They provided valuable insight into not just the research behind my project, but also into the wider world of academia. Furthermore, weekly group meetings gave me a glimpse of the fascinating work being done by members of the research group, and the standards that are expected in the academic community.

Not only did my UROP give me invaluable experience, it also re-enforced my decision to pursue the Mechanical Pathway as part of my third year in Biomedical Engineering. I am also able to keep in touch with members of the group in the future, which is extremely useful for the fields that I am intending to pursue, both for industry and academia.

I recommend the UROP experience to everyone, even for people with no interest in academia. You will definitely gain valuable insights, learn useful skills, and make connections which will be helpful for future work both within and outside the university.