A Physicist’s Perspective

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About Me

• Physics BSc at University of Exeter
• Took a few biophysics modules applying physics models & equations to cells & biological processes
• UCL internship doing biomedical engineering – caught the research bug
• Had never used a pipette before rotational training

• Wanted a biomedical engineering research opportunity willing to accept someone completely unqualified
My Supervisor & Project

• Supervisor: Dr Pola Goldberg Oppenheimer
• Project: Develop an in-vivo, eye-safe and portable device to diagnose Traumatic Brain Injury (TBI) using Raman spectroscopy.

• TBI sustained when damage is inflicted on the skull & is responsible for approx. 50% of trauma-related deaths worldwide per year.
• Currently diagnosed using CT and MRI scans, Raman spectroscopy could be a faster, more accessible and portable alternative.
Raman Spectroscopy

- Inelastic scattering: Laser wavelength ($\lambda_{\text{Rayleigh}} = \lambda_{\text{laser}}$) is not equal to the scattered wavelength.
- Peaks correspond to molecular bonds, giving a ‘fingerprint’ of the chemical structure.
Industrial Supervisors/Partners

• Defence Science and Technology Laboratory (DSTL)
• Industrial supervisors: Dr Abigail Spear & Dr Chris Howle

• Gave a presentation including our progress with the device.
• Was given a tour of the research facilities including optics and cell culturing labs.

• Kick-started partnership, set some future plans in motion and made me realise that DSTL isn’t scary.
Cohort Experience

• Rotational training helped me realise our cohort are kind, patients and willing to help when you are new to a task or subject – you’ll only benefit from this if you speak up about what you don’t know!

• The motivation and support from our cohort feels like a family – this really helped me when also dealing with a new city, discipline and work-life.

My First Cell Culture!
Cohort Experience

• After the training I felt I understood the motives of the CDT better and was stimulated to represent the CDT on social media and at networking events.

• Knowing all of my cohort members and being comfortable around them gave me the confidence to apply for the interdisciplinary skills student rep. position.
Conclusion

• Valuable to have an Industrial Partner that is compatible with the student and the project; making early connections and having an additional base to work helped me feel established.

• Having the intense rotational training early on in our 1st year made me feel relaxed, supported by my cohort and well-equipped to represent the CDT in networking events.

• I feel proud and privileged to be a part of a unique CDT that sees the potential for a wide range of students in becoming future leaders in our field.
Thank You!