Exploring professional bioscience

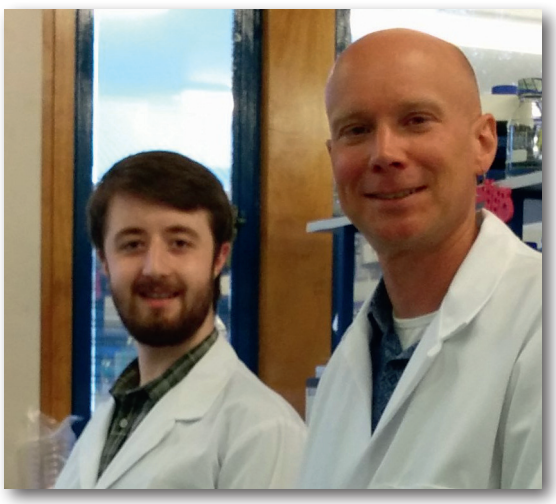
Accounts from some of this year's Summer Vacation Studentship awardees

Rachel Burnett (Education and Public Engagement Officer, Biochemical Society)

Gaining laboratory experience is essential for students considering a career in research. Each year, the Biochemical Society awards Summer Vacation Studentships to support undergraduates doing just this. The grants are a stipend of up to £1600 over 6–8 weeks over the summer, with students being supervised by researchers who are members of the Society.

In 2015, we funded 44 undergraduates, working in laboratories across the UK. Below are accounts from Connor Sampson and Simona Vatavu, outlining their experiences during their Summer Vacation Studentships.

Connor Sampson – University of Kent



Connor Sampson and Dr Tobias von der Haar

When I signed up for the studentship, I had very little idea what I was getting myself into. I have been interested in a research career since a very young age, yet in recent years I was beginning to move away from the idea, imagining laboratory work to be dry and repetitive. This studentship, I decided, would give me the information I needed to settle the matter.

The lab itself was an initially daunting environment; worktops covered in machines I barely recognized, shelves full of chemicals I didn't know, and scientists busying themselves about projects I couldn't guess at. After the first day, however, I had been briefed on my project, given reading material, and begun work with the postdoc I was placed with. I still felt out of my depth, but things were getting interesting.

The project focused on the effects of translational errors studied though the comparison of two glutathione transferase (GST) genes transformed into Saccharomyces cerevisiae hosts, both producing the protein with either low- or high-accuracy codons. This allowed my studentship to follow a range of objectives, such as simply producing the protein, studying the effects of protease mutant knockouts on comparative

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GST yields, observing the effect on host cell growth rate and testing novel electrophoresis techniques.

Before long, I was feeling at home in the lab, the uncertainties of the early days being replaced by a genuine enjoyment of the work. The project gave me a range of activities to either help with or run solo, working with many of the once mysterious devices, frequenting the now familiar shelves of chemicals and chatting with the approachable scientists.

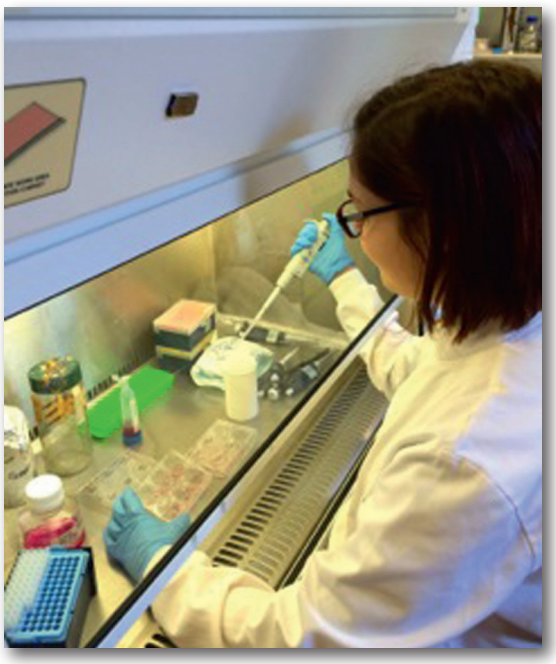
I had carried out laboratory practicals before, but they simply did not compare with real lab work. Suddenly it wasn't a matter of simply following instructions one afternoon, but an ongoing, evolving, engaging project without the constant threat of lost marks at the slightest mistake.

The last two weeks were particularly memorable, as both my supervisor and the postdoc I worked with were away, leaving me under the watch of other lab members, but working independently towards certain objectives. I recall arriving on the first Monday, discovering bacterial contamination to have torn through 12 transformed yeast strains, and realizing I should remake them myself. The independence of it, although daunting at first, was a great experience and the highlight of my academic career thus far.

Another difference between this and the laboratory practical sessions I had done before was that the results meant something. It was aiding ongoing research, and that to me was rather exciting.

The overall experience was a very positive one which, as well as greatly adding to my skills, served its purpose. I now have a far better idea of what professional research is like, and I remember why it used to attract me. Now I have little doubt that this shall be my career , and I thank the Biochemical Society for making it possible.

Simona Vatavu – University of Sheffield



Simona Vatavu

At the start of my studentship, I felt rather overwhelmed with having to adjust to working in a research lab, having to search for and read relevant publications, as well as learning new techniques such as cell culture, small interfering (si)RNA transfection, Western blotting and immunofluorescence. The project was very slow to start with, as I had difficulties with nearly every aspect. In striving to optimize protocols, the challenges provided me with opportunities to collaborate with other lab members and improve my communication skills as well as trouble-shooting skills. Along the course of my project, I became more proficient in planning experiments, managing my time, becoming more independent and learning to report and present data effectively. By the end of the project, despite not achieving all of my aims, I felt a lot more confident in my practical skills and dexterity and I have also grown in confidence and passion for the topic I have been working on, evident by my inability to shut up about it whenever someone asks!

My aim was to target transcriptional activation to cause genome instability in hormone-dependent prostate cancer. The novel strategy of targeting transcription rather than replication may prove of great value against cancers that exhibit low proliferation rates, as is the case with prostate cancers. I knocked down tyrosyl-DNA phosphodiesterase 1 (TDP1), an enzyme important in the repair of protein-linked DNA breaks caused by the abortive activity of topoisomerase I (an enzyme involved in relieving torsional stress during processes such as transcription), with the aim of making cells hypersensitive to transcription-associated topoisomerase-linked DNA breaks. I then induced transcription of androgen-driven genes with the androgen hormone dihydrotestosterone (DHT), and subjected the prostate cancer cells to camptothecin (CPT), a topoisomerase I poison. The depletion of TDP1 and addition of CTP-sensitized hormone-responsive prostate cancer cells to androgen overwhelmed them with DNA double-strand breaks, hence transcription may well be a potential therapeutic target.

"Now I have little doubt that this shall be my career"

The studentship has allowed me to work full time in a lab for 2 months, and I strongly believe that this has provided me with a much more integral and balanced view of what research is truly like, compared with normal lab practical sessions or third-year experimental projects which lack continuity. Thus, the studentship has been extremely valuable in strengthening my desire to pursue a research career. I have also been offered the opportunity to do my Master's research project and possibly continue with a PhD in the same lab, on a topic I continue to be very passionate about. This most probably would not have happened without the aid of the studentship, which I am infinitely grateful for and unreservedly recommend to all undergraduates considering a research career. ■

Applications for the 2016 Summer Vacation Studentship grants are now open.
To find out more and to apply, please visit
www.biochemistry.org/Grants/SummerVacationStudentships