



Gradline aims to inform and entertain members in the early stages of their career in microbiology. If you have any news or stories, or would like to see any topics featured, contact **Jane Westwell** (e j.westwell@sgm.ac.uk).

Vacation studentships – opportunities for all

SGM vacation studentships support a short project by undergraduate students in the vacation after their second year of study. For undergrads the studentships provide an opportunity to get a taste for what microbiology research is really like. Some students love it and go on to do a PhD. However, others discover that research is not quite what they expected and they pursue different career paths after graduation. Either way, the studentships are a valuable opportunity to try out research without any commitment to a 3-year project. Students also learn new techniques, develop planning and organization skills, and experience working with a team of other researchers. All this and a bursary of £180 per week – what's not to like? If you are an undergrad and interested in the scheme, you will need to find a lecturer in the department who can apply on your behalf.

Postgrads and postdocs might be wondering 'What has this got to do with me? How can I benefit?' The answer is that summer studentships can be an opportunity to develop as researcher. Do you ever have an idea that you just don't have time to explore? Could it be turned into a project for a summer student to carry out in 6–8 weeks? If you are a postdoc planning a long-term research career it is essential to develop your own interests and start to think about your strategy as an independent researcher. All this needs to happen whilst still fulfilling the demands of your own project – but it can be done and makes a big

Every year the SGM funds about 50 Vacation Studentships, but it's not just undergraduates that can benefit, as **Jane Westwell** describes.

difference when you start applying for lectureships or research fellowships.

Applications

If you do have an idea that could be turned into a project there are a few things to bear in mind. Competition for the vacation studentships is tough; we get many high quality applications each year which are assessed stringently by an award panel. The best route to success is to work up an idea with an experienced vacation student supervisor who knows how to balance research aims with the educational needs of undergraduates. For PhD students and early-career postdocs it is essential to make a joint application with an established researcher, going it alone will not be successful. Grants are awarded to projects that are achievable in 6–8 weeks, give the students good experience of research and allow some opportunity for initiative on their part. Anything that looks like the applicant just needs an extra pair of hands for a few weeks does not get past the panel. Rules and application forms for the 2008 Vacation Studentship awards are at www.sgm.ac.uk/grants/vs.cfm. The deadline for receipt of applications is 15 February 2008.

► Robert Goldstone (right) standing by his poster at the SGM Manchester meeting in 2007, with fellow student from Exeter University, Phillip James. Sara Burton

Jane caught up with two 2006 summer students and asked them to share their thoughts.

Helen Davies

University of Nottingham
BSc (Hons) Microbiology
Project The microbial diversity of raw ewes' milk cheese; a metagenomic study
Supervisor Dr Tim Aldsworth

Q What led you to study microbiology?

Throughout school I always had a keen interest in biology, particularly at a molecular level. I became interested in microbiology whilst working in a dairy, making cheese, during summer holidays. So even though I studied very little microbiology at school, when I was looking at universities the course still stood out to me.

Q Why did you decide to apply for a vacation studentship?

My tutor told me about the summer studentships. I contacted the dairy I worked at previously about the possibility of researching into the microflora of their raw milk cheese and after discussing methods with a member of the department we applied to the scheme.

Q How did you make the adjustment to full time research during the studentship?

I really enjoyed focusing on one full-time project rather than several smaller subjects in modules during university semesters. I found it to be much more satisfying and in some ways easier even though it was full time.

Q What was the most rewarding aspect of this time?

Being able to develop my lab research skills whilst being paid was really beneficial. When I was writing my report, during the last week of my studentship, I had to review what skills and results I had developed – it made me realize how much I had gained from the experience.

Q You presented your research as a poster at the SGM Meeting in Manchester – how did you find the experience?

I was quite nervous before the poster viewing session. However, once I began talking to interested people it turned out to be the most enjoyable part of the day. What really made the experience very

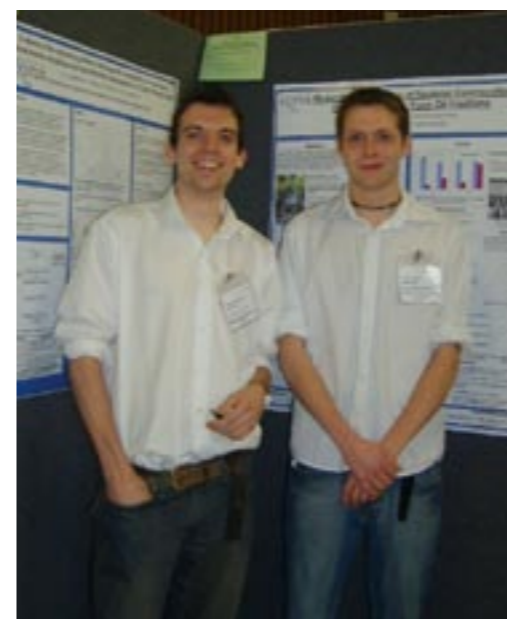
rewarding though, was discovering I had won the Food & Beverages Group Science Communication prize sponsored by the Institute of Food Research.

Q What are your career plans?

I am starting a 4-year PhD in September at the University of Nottingham looking at the effect of probiotics on pig health. The PhD is still microbiology-based as I am looking particularly at probiotic effect on bacterial and viral pathogen loads. After this I plan to continue a career in microbiology research.

Q What advice can you offer future SGM vacation students?

Definitely make the most of the opportunity. Learning how to plan and conduct my own experiments (as well as adapting them when they didn't go according to plan) during the studentship was in some ways more beneficial than the results I obtained. The experience of working in a lab prepared me for my degree project and – I hope – for my PhD.



Robert Goldstone

University of Exeter
BSc (Hons) Biological Science
Project Biofilm and virulence gene expression in polymicrobial communities – a molecular approach to understanding clinical infections
Supervisors Professor Hilary Lappin-Scott and Dr Sara Burton

Q What led you to study microbiology?

I became interested in microbiology whilst studying biology at college. In my first year at university I was lucky to have an environmental microbiologist as an academic tutor and much of my tutor group work was

microbiology-based. I took a second year microbiology module and found the medical and molecular content very interesting.

Q Why did you decide to apply for a vacation studentship?

I talked with my tutor about work experience options and the studentship appeared ideal as it offered a great opportunity in a familiar environment. In all honesty, after being given the chance to apply it would have been foolhardy not to.

Q How did you make the adjustment to full time research during the studentship?

This was remarkably easy, made so in no small part by the support I received

from other members of the lab. During my second year I had begun to use peer-reviewed literature as a primary resource – this was invaluable as it prepared me for the sorts of technical language I would encounter during research. Effective time management and keeping a detailed record of my work was key to adjusting to full-time research.

Q *What was the most rewarding aspect of this time?*

I really enjoyed having the freedom to explore areas of microbiology I found most interesting within the bounds of the research proposal. I could take my own ideas through experimental design and find out about something that was important to me. It was particularly satisfying to discuss with technical staff ways around problems as this made me feel like a real researcher! It was very rewarding to be right in the middle of a hugely active and important area of biology. It was great to interact with researchers – asking questions and expanding my own knowledge. I feel that I improved academically as a result of the experience.

Q *You presented your research at the SGM Meeting in Manchester – how did you find this experience?*

It was a fantastic experience, a must for any undergraduate lucky enough to have the opportunity. This was my first conference, which I anticipated to be quite daunting; however, the atmosphere was very receptive and made me feel at ease. I attended talks and also enjoyed being able to move around between the diverse sessions. I presented my research as a poster, which was displayed alongside others. Many of the other posters were incredibly interesting and I felt proud to have mine presented among them.

Q *In what way have these experiences influenced your future career plans?*

Working in the lab with research students influenced my decision to apply for a PhD. I enjoyed using research techniques and the wealth of information and online tools available. I realized that I would like to include this in my future career. The SGM meeting was particularly influential since it was there I met my future PhD supervisor.

Q *What will you do next?*

This September I am starting a PhD in bacterial quorum sensing at the Institute for Infection, Immunity & Inflammation, University of Nottingham.

Q *What advice can you offer future SGM vacation students?*

Have a good idea of what you're doing and where you're going before you begin and don't slack; 8 weeks is not a long time to carry out meaningful research! Take every opportunity to learn new techniques. If you do present your findings at a conference – don't worry, it's normal to be apprehensive, but it really will be fine!

PhD students from Sheffield were given a challenge. Going out to promote microbiology in a local primary school was daunting, but not only did the kids enjoy the experience, the students learned a lot about their own capabilities too.

Our mission, and we chose to accept it, was to plan and implement a science engagement project as part of our PhD training programme. We formed a six-strong group, with a developmental biologist, a cancer researcher and four microbiologists. We chose to present a microbiology workshop to primary school children, as microbiology rocks and the microbiologists were in the majority!

Our first major hurdle was to decide how to present the subject in an engaging manner that would keep the children interested for at least an hour. We decided to have a short introduction, followed by four workshops (good microbes, bad microbes, make your own microbe and microbes in the environment) for which the children were split into groups, and then some drug resistance games, a summing up and Q&A session with the whole class to finish. How these sections would then fit together and flow on the day was another matter entirely, and one we left mostly to luck!

On the day of the workshop we arrived at the school early so we had plenty of time to sort ourselves into something resembling a team. We were to present our workshop to Year 5 children at Hunters Bar Junior School, Sheffield, which has three classes, and so we had about an hour and a half with each class. As the children started to mill about the school, the thought of keeping control of a class of 35 suddenly seemed a lot more of a challenge than we had anticipated. But Kelly dressed up as a mad scientist for the start of each session to challenge the children's perceptions of a scientist and the sight of her looking like Einstein lightened the mood. We began to think we might be able



To boldly go ... into primary schools

to wing the sessions and get some children interested in microbiology too!

In our first session, as all the children were seated and looking attentive, one of the boys on the front row pointed at Kelly in her Einstein outfit and remarked 'look at him'. At this point we felt the work we had planned was aimed at the correct level and Mel launched into the introduction: what does a scientist have to be like? Lab coat? White hair? Glasses? Male? As we discarded each aspect Kelly lost that part of her disguise. The children thought this was very funny and it set the session off to a great start.

Once the basic idea of 'microbes are small' had been put across, we split into the four workshops with Kelly running bad microbes, Megan running good microbes, Rachel B doing make your own microbe and Marie doing bacteria in the environment. Rachel J and Mel floated around the workshops, helping where needed and ensuring smooth swap-overs.

The bad microbe workshop was full of nasty pictures. The good microbes workshop had fantastic facts like, 'there are more bacteria in a tub of Yakult than people on the planet'. Microbes and the environment had the children touching agar plates before and after washing their hands, and the make your own microbe workshop was a chaos of coloured paper, sticky tape, bubble wrap, wool and string.

When everyone had completed the four workshops, Rachel J brought the

whole class back together for a few games. The children played Chinese whispers to see how bacteria can pass on antibiotic resistance, where the secret 'resistant' word was 'sausages'. Then they played resistance tag, where children acting as antibiotics 'tagged' children acting as bacteria, showing that the more antibiotics, the quicker the bacteria die. Finally, Mel wrapped up the session with a recap and a Q&A session, and we were delighted at how much the children had learnt. They knew about bacteria, viruses and fungi, what flagella were (although one boy was convinced they were called fla-jelly), why you had to finish your course of antibiotics and why antibiotics don't work on viruses.

After the first class, the other sessions flew by. We were amazed at how much all the children had learnt, the fact we didn't have to tell a single person off and that we, remarkably, seemed to have put all the different bits of the day together seamlessly.

We incubated the plates from the environment workshop overnight at the university, sealed them all up and returned to the school the following day. The children were amazed by what had grown on their plates, and we were surprised at the number of boys who had more bacteria on their hands after they had washed them than before! This, we were told, was because they played football with the soap in the boys' toilets. The children had lots more questions for us and had obviously enjoyed our lesson and thought about it after we had gone.



Overall, the sessions ran really well and we were all surprised by the amount of knowledge we managed to pass on in a short period of time. The concept of going into a primary school with very little experience and being able to make a difficult subject easily accessible to a large group of children was daunting, but in reality was fun and very rewarding. It made us realize that the public are interested in the knowledge we have, and that it's our responsibility to communicate it at a level they understand and are enthused by. We'd recommend that every scientist goes back to school for a day – you never know what you might learn!

Melissa Wragg and Kelly Davidge
University of Sheffield
(e mbp05mmw@sheffield.ac.uk)

◀ Kelly in her Einstein disguise with the team.

▲ Children making their own microbes.

▲ Children listening intently to Marie.

All photos Ron Adams