

**BCI STARS 2015**  
**Report for The Biochemical Society by Prof John F Marshall**

In July 2015, twenty-five year 12 school students aged 16-17, who had just completed their AS levels were invited to Barts Cancer Institute, Queen Mary University of London (QMUL) for a one-week intensive practical course in general research laboratory skills.



**School students practicing how to accurately use micro-pipettes**

The students were taught, in groups of 3-4, by PhD students to do the following:

- How to correctly use micro-pipettes and automatic pipette guns
- Sterile tissue culture of cancer cells
- Biochemical analysis of cancer cells using SDS-PAGE and western blotting
- Label biomarkers in cancer tissue using immunochemistry and analyse by microscopy
- How to purify, analyse and clone DNA
- How to run polymerase chain reactions (PCRs) of cheek cell DNA



**Attentive school students listening to a “Lightning Seminar” delivered by one of the PhD facilitators.**

In addition, university staff from Widening Participation came to advise the students on completing their university application form, how to write their personal statement and budgeting as a student. **BCI STARS 2015** was a huge success aided in no small way by an award of **£1000 from the Biochemical Society** for which we are enormously grateful. This is the third STARS course we have run and our expectations from BCI STARS 2013, 2014 and

2015 have been far exceeded, both in terms of the positive feedback from our PhD students as well as from the school students (<http://www.bci.qmul.ac.uk/public-engagement/bci-stars>). The original plan was that the STARS courses would provide science communication for our PhD students and enhance the opinions of school students who study science A-levels, of what a research scientist is and thus possibly increase the likelihood of them becoming one or pursuing an allied career. It works! The PhD students love the experience and the challenge of having to describe complex concepts in everyday language; great training for both public engagement and writing grants. The school students love the excitement of being in the lab, but especially working directly with a new young professional every day, who being only a few years older than them, act as inspiring ambassadors of what they could achieve. Everybody wins! We also challenge our PhD students to give "Lightning Seminars" on their own research. Armed with a whiteboard, pen and 10 seconds notice, the academic lead for the morning picks randomly among the demonstrators during a long incubation; this reduces the potential boredom for the school students and gets our PhD students to think on their feet.



**Careful training of a school student by one of our PhD student facilitators during one of our research exercises**

It is our hope that our experience might be repeated elsewhere. In fact, a new course starts at Kings College London in 2016 and will be run by Professor Maddy Parsons; good luck to the King's STARS! If you would like to develop your own STARS programme please contact me ([j.f.marshall@qmul.ac.uk](mailto:j.f.marshall@qmul.ac.uk)) and I will send you an outline of our BCI course with some handouts that you can adapt to your own STARS course.

The school students who attended STARS were mostly identified by the charity access-workplacements (<http://access-workplacements.org/about-us/>) a London-based charity that works with schools that traditionally have a low percentage of their students progressing to universities or other higher education institutes. It's too early to assess the impact of the STARS course but of the seven (of eleven in total) STARS 2013 students who provided feedback, two are now at medical school, one in veterinary school, one studies physics, two biomedical type degrees and one is training to be a mining engineer; ALL of them got their first choice university and degree. We hope this level of success continues. Going forward we would like to follow the successes our young STARS and so the university has provided support to keep in touch with them, probably by e-mail, LinkedIn or Facebook; whatever works.

Below are some comments from the student feedback forms that we insist every student completes on the final afternoon. I think it fair to say the the Biochemical Society money was well spent. Thank you again.

**Students' feedback on their experience of STARS**

*"I hoped to gain more information on research science and also learn one of the basic skills needed to carry out the experiments, and this course has covered every expectation I had before starting"*

*"Speaking to the PhD students was really useful-treated me like an equal which helped me gain knowledge and confidence"*

*"I've thought research science was boring but after the programme I started to like research science as you get to work on your own projects and be independent and I've got to know that I actually like working in (a) laboratory"*

*"It made me realize that I can go to any university I like and I can do the course that I want to do"*

*"Whiteboard explanation sessions were really good and gave a sort of "school explanation"- a format we are used to and helped in understanding more"*

**Do you have any feedback on the teaching approaches used?** *"Continue! Enjoyed every bit of it. I wish I could join again. Thank you."*