Wanted: lab placements and project ideas for post-16s

Jane Thomson (Science Education Projects Manager)

At the launch of the Life Sciences Strategy in 2011, Prime Minister David Cameron said "We can be proud of our past, but we cannot be complacent about our future. The industry is changing; not just year by year, but month by month. We must ensure that the UK stays ahead.”

Two years on, there is evidence that the UK continues to be a well-rounded research nation, with activity (as indicated by article publication) and multidisciplinary competencies across all major research fields. The UK’s field-weighted citation impact continues to rise and now ranks first among the seven other research-intensive countries (Canada, China, France, Germany, Italy, Japan and the USA) and three fast-growing nations (Brazil, India and Russia) despite a decreasing share of global articles. This trend is reflected across most of research fields including clinical sciences, health and medical sciences, and biological sciences (Source: International Comparative Performance of the UK Research Base – 2013 BIS). The UK also hosts more than 25% of Europe’s life science companies.

Here in the Education Department, we are anything but complacent about our future biochemists. We strive to recruit the cream of the crop into biochemistry and can be found at careers fairs across the land promoting biochemistry as a dynamic field in which to work and study with good prospects for employment. We also endeavour to impart a sense of the potential that developments in biochemistry and the life sciences have for contributing to national prosperity and for improving the quality of life of the population.

Our careers information has become even more important in recent years where school careers guidance budgets have been slashed and the prospect of larger student debts mean young people increasingly have to justify their choice of specialism to their parents. The outlook for employment is one of the things students are asking about more and more, and they want evidence that a degree in biochemistry is a good idea.

So what evidence is there? Well, according to graduate destinations data for 2013 from the Higher Education Statistics Agency, fewer than half of biochemistry graduates gained employment within 6 months of graduating and only 16% of these (7% of the total intake) got jobs within scientific research and development (see Table 1). This does not look particularly attractive on the face of it when compared with the destination data for more general ‘biology’ courses and graduates generally.

It is perhaps more heartening for us to highlight that more than a third of biochemistry graduates decided to continue their education full time. What many prospective students do not realize is that postgraduate study is essential for most careers in academic research and very helpful for research jobs in industry. Although there is a whole raft of transferrable skills to be gained in undergraduate biochemistry courses, if we want to generate more world-class biochemists, we must be candid about the employment pathways and encourage the type of student that would be prepared to stay on beyond a degree. Such students are often drawn towards the traditionally longer medicine and veterinary medicine and dentistry courses.
So how can we encourage more of the best students to consider biochemistry?

Possibly the most powerful way of turning young people on to biochemistry is for students to ‘do’ some biochemistry. To undertake a small research project of their own or to experience working in a laboratory alongside inspirational scientists for a few weeks. This is not easy to set up, but a number of schemes have emerged that we might be able to support.

Nuffield placement scheme

Nuffield Research Placements (previously Nuffield Science Bursaries) provide over 1000 students each year with the opportunity to work alongside professional scientists, technologists, engineers and mathematicians across the UK. The placements give sixth-form students hands-on experience of a professional research environment through a 4–6-week placement in their summer holidays. The programme is run by the Nuffield Foundation and works through regional networks to link talented students with organizations undertaking research. The scheme currently works with over 200 different organizations, including universities, commercial companies, voluntary organizations and research institutes.

By working with professional researchers, students gain an insight into a wide variety of science, technology, engineering and maths (STEM) careers. By providing a placement, you can give someone a life-changing opportunity that will help to transform them into a future biochemist.

If you think you have a good project idea, your local Nuffield co-ordinator will help you to shape your project ideas into a distinct plan, with defined scientific or technical content. Your co-ordinator will then find an appropriate student for your project, and you will have the opportunity to interview the student before he or she starts. You will need to fill in a short form outlining the project and provide confirmation that students will be covered by your insurers while they are working at your organization. Supervisors are not required to undergo a Criminal Records Bureau (CRB) check unless there are specific risks involved in the project, such as long periods of one-to-one working. Visit www.nuffieldfoundation.org for contact details of your local Nuffield co-ordinator.

As with all good science, students are required to write a lab report on the work they do. Depending on the project and the type of work involved, your student could be eligible for a British Science Association CREST Award (see below), and many schools and colleges will also accept this report for the Extended Project Qualification (also below).

in2science UK

in2science UK is a charity-run scheme that provides lab placements to gifted A-level students from low income backgrounds.

Gifted A-level science students from underprivileged socioeconomic backgrounds face major obstacles in securing places at top research universities. in2science UK offers these students the chance to work alongside leading UK scientists in order to improve their scientific communication, reading and writing skills. The goal is to increase the number of disadvantaged students successfully applying for scientific research degrees at top UK universities.

The Biochemical Society is proud to sponsor five students through the scheme annually, as well as many members acting as supervisors for students.

Ashley Futcher from Writhlington School who spent 2 weeks with Jim Caunt (Biochemical Society Local Ambassador) at the University of Bath said, “the time which I spent in the lab with practising scientists has really opened my eyes to how they do their jobs. It has fortified my decision to continue on to higher education.

Table 1. Graduate destinations 2013 (%); data from Higher Education Statistics Agency

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<th></th>
<th>Biochemistry</th>
<th>Biology</th>
<th>General Graduate</th>
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<tbody>
<tr>
<td>Employed</td>
<td>39.90</td>
<td>46.30</td>
<td>67.70</td>
</tr>
<tr>
<td>Further study</td>
<td>35.10</td>
<td>26.80</td>
<td>13.00</td>
</tr>
<tr>
<td>Working and studying</td>
<td>7.80</td>
<td>8.10</td>
<td>5.90</td>
</tr>
<tr>
<td>Unemployed</td>
<td>11.70</td>
<td>11.30</td>
<td>8.50</td>
</tr>
<tr>
<td>Other</td>
<td>5.50</td>
<td>7.50</td>
<td>4.90</td>
</tr>
</tbody>
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to study Biological Sciences at a great university like Bath, and to enlighten me of the prospect of staying on to university to conduct research”.

Dr Jim Caunt said, “I first heard about in2science at the Biochemical Society Local Ambassador’s Day. I remember how impressed I was with the project and was keen to support it, so was very pleased when I heard it was to be rolled out to Bath. It was great to meet the students, who were so bright and interested; most pleasing of all was seeing the students experience the thrill of discovery that gets so many of us hooked on science. It was also very useful for us to get a perspective on what the student’s perceptions of work in a research lab might be like before coming to university. This is a great scheme and we look forward to participating again soon.”

In addition to sponsoring five students through the in2Science@ scheme annually, the Biochemical Society will include an option for delegates attending our events to donate £10 or more to the scheme.

If you would like to provide a placement in your lab for 2 weeks during the summer, please register an interest to Rebecca McKelvey at r.mckelvey@in2scienceuk.org.

**CREST Gold Award**

The CREST Award Scheme is the UK’s largest science award scheme for project work undertaken at the pre-university level with over 30,000 awards given out last year. CREST Gold projects are an opportunity for students to carry out advanced project research. They should:

- represent a minimum of 70 hours of project work
- use scientific and/or technical knowledge appropriate to at least AS level or equivalent
- involve recording work through a project report and student profile
- be supported by regular mentor meetings to monitor progress, assess challenges and inform planning.

All Gold CREST Award projects must involve an external mentor with specific expertise relating to a student’s CREST project. No two CREST projects are ever the same, but a CREST Mentor could:

- be a point of access for specialist knowledge or techniques.
- help your student to develop their ideas or guide them as they examine their results.
- arrange relevant work experience or an industrial visit.

Students who are doing CREST Gold projects are often in need of a mentor and project ideas. CREST local coordinators often use www.stemnet.org.uk/ as the route to match mentors with students. If you are interested in becoming a mentor, please contact your CREST Local Coordinator who will be able to advise you further www.britishscienceassociation.org/crestcontacts

**Extended Project Qualification (EPQ)**

The EPQ is a qualification taken in the UK equivalent to an AS level devised by Sir Mike Tomlinson in 2006, during his review of 16–19-year-olds’ education. According to the QCA, the extended project is “a single piece of work requiring a high degree of planning, preparation, research and autonomous working.” The student’s choice of topic is unrestricted, although they must show that it is academically useful, related to either their current course of study or their future career. It can take the form of a dissertation (5000 words being a common guideline). This seems to be gaining popularity in schools with 30,400 EPQ candidate entries in 2013, compared with 28,600 in 2012 and 5100 in 2009, the first year of entry. The project is formally assessed by the major exam boards and the 120 ‘guided learning hours’ (including around 80 hours of project work) would be monitored by the teacher.

For all of the schemes above, if you have any suggestions for project titles, themes and questions for students to investigate that would be feasible in approximately 80 hours of project work, please send them to education@biochemistry.org. We will share them with CREST, the Nuffield Foundation and the Extended Project Support Group (a Wellcome Trust forum helping teachers to run EPQs in STEM subjects).

Jim Caunt (University of Bath, UK) and Ashley Futcher, who were partnered up through the in2science scheme.