STEM Insight – A new opportunity for teachers to experience biochemistry in academia and industry

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‘Inspirational teaching begins with teachers who know and love their subject.’

Careers support in schools and the transition from post-16 education to university have long been areas of concern for those working in bioscience education. Teachers are a key source of information for young people hoping to pursue a career in science. However, many have little or no experience of industry and limited knowledge of science career possibilities or routes into jobs. According to the Wellcome Trust Monitor in 2013, most young people (63%) said they knew little or nothing about careers in science and very few (4%) knew a great deal.

In addition to effective careers support and information, practical work and mathematics are essential parts of bioscience education at all levels. In September 2015, teachers began teaching the newly reformed Biology A-level in England. The qualification now separates the direct teacher assessment of practical skills at A-level (through the new ‘Practical Endorsement’) from the final exam grade, with students’ understanding of practical work assessed through written exam questions. The Science GCSEs being introduced in September 2016 will assess understanding of practical work solely through written exam questions. Concerns have been raised about the impact that these changes will have on the opportunities for young people to develop practical skills. Similar concerns also exist around students’ confidence in using mathematics in biology contexts as they move from school to university.

High quality continuing professional development (CPD) for teachers is one way to address these concerns, inspiring and informing teachers so that they may in turn do the same for their students. In 2015, the Biochemical Society joined forces with the National STEM Learning Centre and network to launch two new ‘STEM Insight’ schemes for teachers: Insight into industry (formerly the Teacher Industrial Partners’ Scheme - TIPS) and Insight into university (formerly the Teacher Academic Placement Scheme - TAPS).

These programmes are designed to provide one-week placements for secondary and Further education teachers at local biotechnology employers and university bioscience departments, accompanied by a bespoke package of support from the National...
They provide a unique opportunity for teachers to experience modern industry and cutting edge research and teaching within academia and to use this insight to address skills gaps and transform the careers guidance throughout their schools and colleges. Crucially, they also provide a valuable opportunity for schools to build long term relationships with local bioscience employers and universities, with mutual benefit for all involved as the case studies in this article show.

While the Industry placements have built on the success of an existing scheme in engineering, the Biochemical Society is proud to be spearheading the university version. The first placements for both programmes were held in February 2016 and we have been delighted with their success. Gaining buy-in from schools and teachers to take a full week out of the classroom remains a challenge and we are working to engage teachers, head teachers and policy makers with the value of these types of experiences and show how they will help schools to respond to the forthcoming Government Careers strategy due to be published later this year. We hope that over time they will become a core part of the CPD offering for science teachers across the UK and a key element in supporting the next generation of biochemists.

If you are interested in hosting a placement at your company or university, please contact Hannah Russell, Head of Education & Training.
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Insight into Industry - Syngenta

Jealott’s Hill International Research Centre is a key site in Syngenta’s global Research and Development network. With over 85 years tradition of innovation, it is the company’s largest site for new agrochemical R&D, product support and home to more than 800 scientists in a range of Biology and Chemistry-related disciplines.

Laura Manning, curriculum leader for biology at UCL Academy spent a week at Jealott’s Hill in February 2016.

“I had a fascinating week being hosted by scientists with very different backgrounds, interests and responsibilities. As a result of my placement, I am now much better informed about what it is to be a scientist, which will help me develop careers guidance activities for my students who might be considering STEM careers. I can also use specific examples of experiments and theory I encountered to enhance the curriculum for students, so that they can see how what they learn in lessons can be applied in the real world”.

This positivity has also been reflected by Syngenta. Jim Morton, Visits and Outreach Manager at Syngenta said:

“We host as many as 50 work experience students and a number of school groups at Jealott’s Hill during the year and the Insight into industry programme builds on that. It is a great opportunity for us to engage directly with teachers and to promote the opportunities that are available to students studying STEM subjects. It really is a ‘gift that keeps on giving’ – the teachers will have a number of classes across multiple year groups and also interact with other teachers so that the insights they have gained during this week will be shared more widely. This was all made possible by the great enthusiasm shown by our scientists during the week and their commitment to stay in touch with the teachers”.

Syngenta is one of the world’s leading agricultural businesses. High-yielding seeds and innovative crop protection products help farmers around the world to get more from their land and preserve ecosystems. To find out more please visit www.syngenta.com.
Maria Saeed, Lecturer in Science at Blackburn College spent a week at the University of Liverpool in February 2016.

“The week was a great experience and I am now putting into practice what I have learnt. For example, I am working on developing a numeracy skills pack for all learners, and I am hoping to do several practical sessions in the same format I saw at the university that worked very well... I believe the scheme has been invaluable in developing my own teaching practice and the links between the college and Liverpool University in the long-term.”

Developing long-term relationships with local schools and colleges has also been one of the main benefits of the Insight into University scheme for the University of Liverpool. Dr Luciane Mello, Senior Lecturer at the School of Life Sciences at the University said:

“We see the week as a big success since firm plans have been made involving staff visits to talk at the College; a visit of Sixth Form students to the University of Liverpool and a visit by a current undergraduate student to the College, sharing her university experience with the student body there. While the College teacher refreshed her knowledge on what is taught to year 1 undergraduates, University staff were reminded of the Sixth Form curriculum. Importantly, we also got a better understanding of the differences between the BTEC and A level curricula and the forthcoming changes.”

Dr Patrick Eyers, Reader in Biochemistry at the University of Liverpool added:

“We are acutely aware that one of the ways Liverpool can improve the undergraduate biochemistry experience is to empower school and college teachers with the confidence to cover the more challenging aspects of chemistry and biology on the syllabus with students, ideally before they reach us in Liverpool. We believe that any time that we spend establishing collaborations with teachers is therefore time well spent...Firstly, our teacher’s get to see how modern research works and how technology has changed what many biochemists do for a living...and secondly, we get a real feel for the needs of teachers, whose workloads are daunting, and who are at the real cutting edge of education. Finally, the major outcome of this scheme for the University is the firming up of a direct link between secondary and tertiary education, in which passionate teachers in each sector are only an email away”. ■

For full versions of these case studies, please visit www.biochemistry.org/education

The following placements are available in October and November 2016:
• University of Liverpool
• University of Exeter
• Queen Mary University of London
• University of Birmingham
• University of Cambridge
• Babraham Institute (Cambridge)

The deadline for teachers to apply for one of these placements is 30th June 2016.
For more information, please visit www.stem.org/stem-insight