

Inspiring minds with exciting science

Babraham's vibrant Science & Society Programme offers a broad range of events for people of all ages and backgrounds. We aim to provide a better understanding and appreciation of the Institute's research, its applications and the implications these advances have for society. As life science technology leaps forward at an unprecedented rate, there has never been a greater need for effective communication by the scientific community and engagement with society. We provide a forum for dialogue with our stakeholders, to better understand public concerns about biomedical breakthroughs to ensure that these may be translated into innovations to improve global healthcare. The Institute has taken a pivotal role, regionally, delivering events that bring science closer to society and enable pupils to gain valuable insights into the exciting world of biomedical research. In 2007, the Institute's pioneering work with young people was recognised with the BBC East and EEDA-sponsored 'Work With Schools' Large Business award.

Strengthening School Science

Our Schools' Engagement Programme, designed to inspire and enthuse young people about science, has developed substantially since 2005. We work with all ages from pre-school to 6th form and across the breadth of the educational spectrum. Our scientists and PhD students are encouraged to gain 'public engagement' experience and many act as role models to inspire an interest in biomedical research. Our team takes science into schools, assisting in classrooms, providing lectures, equipment and practical expertise. We also host pupils and 'home-schoolers' at the Institute, enabling pupils to gain 'hands-on' lab experience and interact with inspirational scientific mentors. Bioscience Enterprise workshops have been developed, explaining how science becomes a commercial reality. Through offering careers advice, work-experience and enthusiastic role models we hope to inspire the next generation to pursue careers in science. We collaborate with 'Cambridge Biologists', a network for teachers and institutions delivering science to schools; our Teachers' Open Evenings facilitate dialogue and explore how we can best contribute to school science.



6th Formers experiencing life at the bench at Schools' Day:

"Great to see the processes and their applications that we learn about at school in 'real life'. By doing your supervisor's experiment with them, you really felt a part of science at the cutting edge."

"It was brilliant to have so much hands-on lab work and to be able to see the techniques used by researchers, as well as complex machinery/software, which I would never be able to experience at school. All the scientists were excellent mentors."

Schools' Day takes place during National Science Week each year, providing about 140 GCSE students and sixth formers with the chance to experience research alongside 'real scientists'. We explain how laboratory science works, what scientists do and the societal impact of our research. Pupils spend the day immersed in lab projects involving techniques like

microscopy, Polymerase Chain Reaction, cloning and DNA digestion. Discussions over lunch with inspirational role models aim to raise awareness of the diversity of career options a degree in science offers.

'Researchers in Residence' aims to make science more stimulating to the next generation through contact with young role models, passionate about their science. Several PhD students and post-docs undertake a more formal arrangement with a secondary school through this national scheme. Nadia Shivji recently worked with Year 7 students at Witchford Village College. "It was an enjoyable experience taking science that we do at the Institute everyday, into the classroom. It was tough to challenge and excite so many young brains at once, but it also taught me to look at science differently. When you get stuck into your PhD project, it's good to take time out and take a step back, and communicating science to children definitely makes you do that."

6th Form 'Concept to Clinic' Conferences were another new initiative, launched in November 2007, designed to present the scientific, ethical and commercial applications of a key area of biomedical research and its application to human healthcare. The inaugural conference on stem cell science provided an unrivalled chance for 6th formers to gain insights into this topical subject from leaders in the field. Professor Allan Bradley and Professor Roger Pedersen reviewed the historical and academic research perspective and outlined the conditions that may benefit from stem cell-based therapies. Speakers from two companies at Babraham's BiIncubator (NovaThera Ltd. and Stem Cell Sciences, plc) explored the commercial applications, allowing students to reflect on the challenges that need to be overcome before the potential of stem cells can be realised in the clinic. Students later worked in small groups with facilitators using the DEMOCS 'game' designed to stimulate debate about the ethical dimensions of stem cell research and other controversial technologies.

A second conference on the "Bioscience of Ageing" will take place in June 2008 during the Institute's 60th Anniversary celebrations. It will highlight the Institute's research investigating the processes through which we age and develop disease with insights into how this knowledge will address healthcare challenges. Supported by the BBSRC, these conferences aim to enrich A' level biology, broaden pupils' awareness of socio-ethical issues in science, contribute to teachers' Continuing Professional Development and, by engaging with leading researchers, inspire the next generation to consider scientific careers.



Discussing ethical issues of stem cell research at the inaugural 6th Form Conference, November 2007.

"The day was a great experience; the lectures were inspiring and gave an insight into the world of research and its relevance to society. Mixing with other 6th formers to exchange ideas and experience different attitudes was a great benefit. It also served a purpose in looking at a part of the syllabus that would enable them to extrapolate ideas

and consider ethics and social consequences and 'how science works'. It introduced our new A' level students to a more grown up world where they were treated as adults and their opinions were valued."
Maria Dixon, Head of Biology, Hitchin Girls' School



'Real Life, Real Science', for primary schools, seeks to reverse the reported decline in children's interest in science by taking real scientists into classrooms to transfer excitement for science to the next generation. Since its inception in 2005, we have made 100 visits to 25 primary schools and nurseries, and delivered over 20 activities to over 5000 children aged between 3 and 11 years. Topics, developed in consultation with teachers and the National Curriculum, reflect aspects of the Institute's healthcare-related remit, the most popular being: Blood & Circulation, Digestion & Health, Muscles & Bones, and 'What is a Scientist?' The presentations, coupled with exciting hands-on activities, are delivered by scientists, from BSc level to the Institute Director and are designed to increase pupils' knowledge of science with an understanding of how it affects them in everyday life. A Science & Society grant from the BBSRC supported the development of new resources and purchase of equipment to enrich school visits. 'George' – our full-size model human skeleton, and 'Georgina' – a dissectible model of a human torso, have, understandably, provoked the most interest. The 'Real Life, Real Science' programme is being extended into secondary schools to combat the much-reported 'transition dip' in early secondary education. We were invited to discuss the principles of scientific research with year 7 pupils at Sawston Village College and are working with their Science Club to encourage their development as Technology Leaders.



"I was in the fortunate position of being able to drop in on classes across the school during the whole day and the buzz of excitement and interest was tremendous. The opportunity to learn from 'real' scientists and the realisation that anyone can be a scientist was invaluable, as was the opportunity to use a wide range of resources not normally available in a primary school. Children from all classes went home saying that science was fun and pleading with us to hold another such (Investigations) day. In the context of great enjoyment, the children learned so much." Head Teacher - Fulbourn Primary School

"The visits have made an enormous impact on both my children, ages 4 and 6 and have awakened a real enthusiasm for science and experiments." Parent/Governor of Fen Ditton Primary School

"Thank you for coming in and explaining about the digestive system and healthy eating. You made it really exciting. The best bit was when we were being the intestine. I've never realised science is so much fun." Pupil - Fen Ditton Primary School

Raising Aspirations about Careers in Science

An objective of government is to increase the attractiveness of science careers to young people. Our work experience programme for young scientists is flourishing; each summer the Institute opens its doors to 6th formers, undergraduates and Master's students, offering valuable insights into biomedical research through short research projects. In 2006, four 6th formers awarded bursaries from the Nuffield Foundation worked in the Signalling Laboratory, where scientists are studying how cells communicate with each other to better understand medical conditions like high blood pressure, heart failure, infertility, cancer and neurodegenerative diseases. In both 2007 and 2008, six recipients of Nuffield Bursaries undertook 4-week projects at the campus.



Students receiving prizes from Sir Michael Berridge (left), after presenting their work at a regional meeting to celebrate the Nuffield Foundation's 6th Form bursary scheme, held at the Babraham Institute in October 2007.

We have also increased research opportunities for undergraduates. In 2006, four undergraduates from the Universities of Cambridge, Edinburgh and Manchester undertook 8-week projects supported by BBSRC's Vacation Bursary scheme and the Babraham Institute. Ausma Termanis (a previous attendee of Schools' Day in 2003) said of the experience, "My summer research project has allowed me to gain invaluable hands-on experience in lab work and develop a deeper insight into an exciting scientific field." Ausma begins a CRUK PhD studentship at Edinburgh University in October 2008. In 2007, the Institute offered seven undergraduates placements, supported by the BBSRC, Nuffield Foundation and Genetics Society.



Younger students also get a taste of the diverse range of careers within a biomedical research organisation through the Government's 'Connexions' scheme. Around twenty GCSE students each year spend 2 weeks working in computing, nursery care, building engineering services, security or in the Corporate Affairs Office to gain insights into science communication and event management. 'Next Steps' is an 18-Month Life Skills and Mentoring Programme for young people aged 16-24 with learning difficulties living in Cambridgeshire. Students visited the Institute in 2006 to hear about vocational career opportunities; one student returned to undertake work experience in our Stores facility in May 2007.

'Bioscience Boot Camp' was pioneered in July 2007 to provide fifteen 6th formers with insights into biomedical research. An intensive one-week programme of scientific seminars, lab work, a science-ethics workshop and careers guidance was devised, concluding with a Bioenterprise Masterclass illustrating the processes through which science becomes a commercial reality. "Boot Camp was fantastic as it had a mixture of straight biochemistry and also looking at behaviour in mice, which I loved," commented a student from Hills Road 6th Form College. "It has really cemented my desire to study biochemistry and given me a much better idea of what research is like."



"Boot Camp confirmed my decision to do a scientific degree and gave me the opportunity to see what real scientists do."

"I wanted to see real research scientists at work and to see what it would be like to be a research scientist and whether this was a career I could see myself following. I now know that I definitely want to study biochemistry."

'Futures & Options in Biomedical Science' aims to bring science and industry closer to young people, increase the attractiveness of science-based vocations and raise pupils' aspirations about employment opportunities. Around 150 key stage 4 students from Comberton, Cottenham and Sawston Village Colleges and Long Road 6th Form have taken part in this half-day workshop at the Institute, supported by grants from the BBSRC and RCUK. Case studies review the role of animals in biomedical research and pupils then discussed ethical issues in small working groups, heard about careers in animal technology and toured an animal research facility then under construction.

"This was a valuable learning experience for the pupils, feedback from students was very positive. They left with a much better feel for the variety of jobs available in the science and construction industries and had the opportunity to consider some important ethical issues surrounding current scientific advances. Several were surprised at the career options available; they held the common view that the only progression from science education was to become a research scientist. This misconception is common despite much effort from the careers service and science teachers and forms an invaluable part of the Institute's link with schools. The pupils were very keen to know more and understandably wanted to see the actual animals and scientists at work." Dr Kevin Geall, Head of Science, Cottenham Village College.



"I learned about the ethics and why we need animal testing. I do enjoy science but I was not considering a career in science. I would however consider being an animal technician because I do love animals and I do also like biology. I liked the way the animals were treated and looked after." Year 10 pupil, Cottenham Village College.

Getting Girls into Science: Our school events are inclusive but we recognise a need to encourage girls into research since women are under-represented in science nationally. Offering opportunities to visit research institutes, chat with role models and see what it's really like to work in the lab is part of our strategy to address this. Over 50% of participants in initiatives like Boot Camp, the summer bursary schemes and the 6th form conferences were girls. In the days when Babraham was still a family home, the Adeane family used to allow the local Girl Guides to camp in the grounds. With a twenty-first century twist, Bottisham Guides camped out in the conference centre for their Easter Camp in 2007; they spent the Saturday afternoon doing science experiments and learning about Babraham's research in signalling and how the heart works.



Bottisham Girl Guides enjoy science and an Easter Camp at the Babraham Institute.

Science in Society

Several events are organised throughout the year to bring the scientific community closer to our public audiences and to exchange ideas. We arrange visits to the campus with tours and scientific talks for the residents of Babraham village and local community groups, such as the Rotary or local business groups. Recent visitors include The Friends of Kettles' Yard, a Cambridge Art Museum which often features science-based exhibitions, The University of Cambridge 'Visiting Scholars' and several international groups, wishing to hear about our science, its applications and our work at the interface of biology and business.

The Cambridge Science Festival attracts visitors from all over the South East. For the last 3 years we have exhibited in the 'Biology Zone', which draws well over 1000 visitors each year. Poster displays explaining our science and its relevance to society, hands-on science activities for children aged three upwards and a Stem Cell exhibit have featured in the past. In 2007 Wolf Reik gave a keynote evening lecture exploring the new science of epigenetics.



Communications skills are central to the success of our public engagement activities. Our scientists and students attend media training courses run by the BBSRC and Science Media Centre (SMC) and many contribute to public debates on science through the media. Several are 'technical experts' for the SMC, providing comment on issues of public interest and have also been involved with delivering press briefings on emerging scientific issues.