Vaccines and Infectious Disease

Oxford University Museum of Natural History

Friday 6th March 2015
# Programme

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<tr>
<th>Time</th>
<th>Event</th>
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<tr>
<td>9.30am</td>
<td>Registration (tea, coffee)</td>
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<tr>
<td>10.00am</td>
<td>Introduction to Immunity and Infection</td>
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<td>Prof Paul Klenerman, University of Oxford</td>
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<tr>
<td>10.30am</td>
<td>Transmission Blocking Malaria Vaccines</td>
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<td>Dr Sumi Biswas</td>
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<tr>
<td>11.00am</td>
<td>An overview of vaccine clinical trials for major infectious diseases</td>
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<td>Prof Adrian Hill</td>
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<td>11.30am-1pm</td>
<td>Lunch, careers advice, Meet the Scientist, DNA origami &amp; Malaria Life Cycle and scientific experiment</td>
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<td>Exhibitors and hands on activities</td>
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<tr>
<td>1.00pm</td>
<td>Vaccines for Tuberculosis</td>
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<td>Prof Helen McShane</td>
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<td>1.30pm</td>
<td>Meningitis - why are teenagers at risk?</td>
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<td>Dr Matthew Snape</td>
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<td>2.00pm</td>
<td>GUEST LECTURE</td>
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<td>Professor Peter Piot – Director of the LSHTM, Professor of Public Health, co-discoverer of the Ebola virus</td>
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<tr>
<td>2.45pm-3.30pm</td>
<td>Panel Discussion/Debate</td>
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The British Society of Gene and Cell Therapy (BSGCT) was founded in 2003 with the intention of providing a professional network for scientists and clinicians researching genetic disease and novel therapies. The BSGCT society membership is made up of hundreds of research scientists from PhD level to Professor. Since 2003, we have provided a forum for discussion and debate in the area of cell and gene-based therapies, engaging not only researchers but reaching out to patient groups and the general public. We are particularly committed to improving public awareness of gene therapy and providing education to students and young scientists. The BSGCT have run the annual Public Engagement Day since 2005 and every year it has gone from strength to strength. Our intention is to inform, and ultimately to stimulate discussion and debate within the public on many important issues including stem cell research, personalised medicine, genetic screening and emerging radical therapeutic approaches. We hope that our public engagement days inspire young GCSE or A-level students to pursue life sciences or medicine at university level, and to potentially become the shining stars in research for the future. It is essential that we attract the brightest minds to the field.

The Jenner Institute

The Jenner Institute was founded in November 2005 to develop innovative vaccines against major global diseases. Uniquely it focuses both on diseases of humans and livestock and tests new vaccine approaches in parallel in different species. A major theme is translational research involving the rapid early-stage development and assessment of new vaccines in clinical trials. The Institute comprises the research activities of over 25 Jenner Investigators who head leading research groups spanning human and veterinary vaccine research and development. Together the Institute Investigators comprise one of the largest non-profit sector research and development activities in vaccinology.

Jenner Institute Investigators, through the support of many funders, are developing new vaccine candidates against major global infectious diseases. New vaccines against malaria, Ebola, influenza, tuberculosis and HIV are currently being tested in clinical trials. Research is also underway on livestock vaccines against foot and mouth disease, avian influenza, bovine tuberculosis and other major causes of economic loss.

The Institute is a partnership between the University of Oxford and the The Pirbright Institute and is the successor to the former Edward Jenner Institute for Vaccine Research. The Institute is supported by the Jenner Vaccine Foundation, a UK registered charity and advised by the Jenner Institute Scientific Advisory Board.

Website: http://www.jenner.ac.uk/about-us, Twitter: @VaccineTrials
Hands-on activities

During lunchtime, try your hand at making DNA origami, find out about the malaria life cycle and how vaccines for Ebola, TB and Malaria are being tested in clinical trials in Oxford. Come to meet and interact with some of the world’s leading experts who will be talking about their research in the field of immunology, vaccines and infectious disease. Chat to PhD students and post-doctoral researchers about their career choices and their current research projects.

DNA origami
DNA, or deoxyribonucleic acid, is an instruction code for life. Nearly every cell in our body contains the DNA required to make a new copy of ourselves. The “story” of DNA is split up into “paragraphs” called genes. Each gene contains enough information to make a different protein. Other stretches of DNA are important in telling the cell how much protein to make. DNA manages to do all of this using a four letter code comprising A, T, C and G which stand for Adenine, Thymine, Cytosine and Guanine. DNA is wound into a double helix structure. This is then wound up even further and each compacted strand makes a chromosome. We have 23 pairs of chromosomes in each of our cells however a species of fern called “Adders tongue” beats us by having 630 pairs! At the DNA origami stand you’ll learn how to fold a normal sheet of A4 paper into the shape of the DNA double helix.

Malaria life cycle
Come to our Jenner Institute stand and find out about the potentially fatal tropical infection, malaria. Malaria kills around 600,000 people per year. Investigators at the Jenner Institute are working on developing vaccines to prevent malarial disease and to stop transmission of the parasite. Our facilities include a state of the art insectary where mosquitos are reared for use in experimental models, which examine the complex lifecycle of this parasite, as well as host immune responses to its presence. Look down the microscope at these potentially life-threatening microbes, and at the mosquito vectors that transmit them, and begin to understand the difficulties faced in trying to combat this global killer.

Play a game of infectious disease ‘Top Trumps’ in which you will find out which are some of the deadliest and most widespread pathogens in the world today, and what the scientific community is doing to overcome them.

Take part in a scientific experiment - no needles!
Calling all 16-19 year olds, we need your help! If you would you like to be a part of an important nationwide research study, looking at protecting teenagers from meningitis and septicaemia, then please come along to the Oxford Vaccine Group stand where we are carrying out a simple swabbing study. Meningococcal bacteria can be ‘carried’ at the back of our throats with no illness, but some of us will become ill and, sadly, it can be a deadly infection! Before the vaccine against meningococcal bacteria (type C) was introduced, rates of meningitis were high. Fortunately current rates in the UK are low but meningitis still affects 600 individuals in the UK each year. Voluntary participation takes around 5 minutes and you would be helping to create a bigger picture of which bacterium are circulating in today’s population. Some of you may have already taken part through your school, so come and see what happened after your swab went to the lab.
Speakers

Prof Paul Klenerman I trained in medicine at Cambridge and Oxford and specialised in infectious diseases. I did a PhD with Andrew McMichael and Rodney Phillips in Oxford on immune escape by HIV and a postdoc in Zurich on immune escape and persistence in different virus models. I came back to Oxford with Wellcome Trust funding to set up a lab and my research interests are in the host immune response to persistent infections, especially the role of T cells in liver disease. The lab has established tools to track HCV specific immune responses and link these with clinical outcomes. More recently we have gone on to help develop and assess T cell vaccines against HCV. Email: paul.klenerman@medawar.ox.ac.uk

Dr Sumi Biswas leads the transmission-blocking malaria vaccine group at the Jenner Institute in Oxford and is a Junior Research Fellow at St Catherine’s College, University of Oxford. She moved to the UK from India to do a Masters in Medical Microbiology at the London School of Hygiene and Tropical Medicine. Dr Biswas did her PhD in Oxford on a Marie Curie Early stage training scholarship.

Malaria remains a major public health problem. The malaria parasite Plasmodium requires two hosts to complete its life cycle: a human host, and the female anopheles mosquito. Traditionally vaccines target the parasite stages that affect humans, but transmission-blocking vaccines aim to prevent the development of the parasite within the mosquito. The aim is to vaccinate humans, so that the antibodies generated in humans can be taken up together with the parasites and they will prevent the parasite from developing within the mosquito – then the mosquito can’t transmit the parasite to another individual. This type of vaccine is now widely viewed as essential, especially following recent ambitious calls for malaria elimination/eradication. Her group currently focuses on developing novel transmission-blocking vaccines which are initially tested in pre-clinical models and the most promising candidates are progressed to human clinical trials.
Prof Adrian Hill is Professor of Human Genetics and Director of the Jenner Institute at Oxford University. He leads research programmes in genetic susceptibility to tropical infectious diseases and in vaccine design and development.

His laboratory at the Wellcome Trust Centre for Human Genetics has identified susceptibility loci for many infectious diseases, mainly in African and Asian populations. These include susceptibility genes for tuberculosis, bacteraemia, pneumococcal disease and malaria.

His vaccine group at the Jenner Institute identified heterologous prime-boost immunisation as an exceptionally potent approach for inducing protective T cell responses in murine malaria and undertook the first clinical trials of this vaccination strategy. He is currently leading the Oxford-based trials of a candidate Ebola vaccine to determine whether it is safe and immunogenic, as part of a global rapid response programme. If Phase 1 trials are successful, next phases will involve the vaccination of frontline healthcare workers in Ebola affected countries.

He also chairs the Centre for Clinical Vaccinology and Tropical Medicine and the Clinical Biomanufacturing Facility in Oxford. He has published over 450 research papers, is a Fellow of the UK Academy of Medical Sciences, the Royal College of Physicians and a Wellcome Trust and NIHR Senior Investigator.

Prof Helen McShane obtained an intercalated BSc in 1988, and then a degree in medicine in 1991; both from the University of London. After junior hospital posts during which she obtained MRCP in 1994, she worked as a registrar in Infectious Diseases and HIV/GU medicine for 3 years. She was awarded an MRC Clinical training Fellowship to undertake a PhD with Adrian Hill in Oxford in 1997, and was awarded a PhD in 2001, also from the University of London. In 2001 she was awarded a Wellcome Clinician Scientist Fellowship to establish a translational programme of vaccine research evaluating new TB vaccines in the clinic. This fellowship also allowed her to complete her clinical training and she was awarded a CCST in HIV
Speakers

and GU Medicine in 2003. In 2005, she was awarded a Wellcome Senior Clinical Research Fellowship, which she took up in 2006; this Wellcome Senior Fellowship was renewed in 2010. She collaborates extensively with TB research groups in Africa including the South African TB Vaccine Initiative at the University of Cape Town, Chu Le Dantec in Senegal and The MRC Laboratories in Uganda and The Gambia. Her research team continues with the programme of translational Vaccinology in TB vaccine development, and is involved in developing new assays for monitoring vaccination induced cellular immune responses, developing a BCG challenge model in humans and the aerosol delivery of vaccines.

Dr Matthew Snape MBBS MD, is a Consultant in General Paediatrics and Vaccinology at the NIHR Oxford Biomedical Research Council and the Children’s Hospital Oxford, Oxford University Hospitals NHS Trust. He is also an Honorary Senior Clinical Lecturer at the Department of Paediatrics, University of Oxford and a Jenner Investigator.

He graduated from the University of Melbourne in 1993 and completed his basic paediatric training at the Royal Children’s Hospital, Melbourne before continuing his training at St Mary’s Hospital London. While working in the Paediatric Intensive Care Unit at this hospital he became interested in the prevention of invasive meningococcal disease by immunisation, and on completion of his clinical training took up a post as a research fellow (later Clinical Lecturer) at the Oxford Vaccine Group, University of Oxford. While here he completed his post-graduate Doctor of Medicine (MD) degree, awarded by the University of Melbourne in 2009. He has been employed as a Consultant in General Paediatrics and Vaccinology by the Oxford University Hospitals NHS Trust since 2009. His principle areas of research relate to meningococcal, pneumococcal and influenza vaccines, and he has recently obtained funding from Meningitis Now to evaluate attitudes of pregnant women and obstetric health care providers to immunisation against Group B Streptococcus in pregnancy.

Dr Snape is an Academic Training Programme Director for OUCAGS, and oversees the paediatric academic training programme.
Speakers

Peter Piot MD PhD is the Director of the London School of Hygiene & Tropical Medicine, and Professor of Global Health. In 2009-2010 he was the Director of the Institute for Global Health at Imperial College, London. He was the founding Executive Director of UNAIDS and Under Secretary-General of the United Nations from 1995 until 2008, and was an Associate Director of the Global Programme on AIDS of WHO. Under his leadership UNAIDS became the chief advocate for worldwide action against AIDS, also spearheading UN reform by bringing together 10 UN system organizations.

Professor Piot co-discovered the Ebola virus in Zaire in 1976, and led research on HIV/AIDS, sexually transmitted diseases and women’s health, mostly in sub-Saharan Africa. He was a professor of microbiology, and of public health at the Institute of Tropical Medicine, Antwerp, the Free University of Brussels, and the University of Nairobi, was a Senior Fellow at the University of Washington, a Scholar in Residence at the Ford Foundation, a Senior Fellow at the Bill and Melinda Gates Foundation, and held the chair “Knowledge against poverty” at the College de France in Paris.

He is a member of the Institute of Medicine of the US National Academy of Sciences, of the Académie Nationale de Médecine of France, and of the Royal Academy of Medicine of his native Belgium, and a fellow of the Academy of Medical Sciences, UK, and the Royal College of Physicians. In 2008-11, he was the President of the King Baudouin Foundation and was knighted as a baron in 1995. He has published over 500 scientific articles and 16 books, including his memoir “No time to lose”. He was the recipient of the Calderone, Noguchi, and Prince Mahidol awards.

Public Engagement Coordinator (BSGCT and Jenner Institute)

Dr Lynda Coughlan is a post-doctoral scientist working on the clinical development of universal influenza vaccines at the Jenner Institute at Oxford University. She moved to the UK to study for an MSc Virology at the London School of Hygiene and Tropical medicine and completed her PhD in cancer gene therapy in London, 2009. She has worked on engineering adenoviruses as oncolytic therapeutics and now as vaccine vectors for influenza.

She has been heavily involved in the British Society for Gene and Cell Therapy since 2011 when she was appointed to the board as a representative for early career researchers and now leads public engagement activities for the society. Dr Coughlan is a STEM ambassador and is also the Public Engagement Representative for the Jenner Institute, University of Oxford and has led the organisation of the Vaccines and Infectious Disease event. Twitter: @Virusnerdette
Exhibitors

**SETPOINT Hertfordshire.** Nuffield Research Placements offer students in Year 12 the opportunity to work alongside scientists, engineers, mathematicians and technologists for four weeks of their summer holiday. These high-quality summer placements give able students hands-on experience of real research to inspire them about a career in STEM.

**STOP-HCV consortium / Virus Group** is a national consortium, with partners from both industry and academia, aiming to use personalised medicine as an approach to establish the most effective treatments for patients with Hepatitis C Virus infection. The consortium is funded by the Medical Research Council and led by researchers from the University of Oxford.

**The Jenner Institute** is a research partnership between the University of Oxford and The Pirbright Institute. The Institute focuses on the parallel development of human and veterinary vaccines against major global diseases - from early-stage research through to clinical trials. www.jenner.ac.uk

**Oxford Vaccine Group** is an independent multi-disciplinary clinical trials and epidemiology group based at the Centre for Clinical Vaccinology and Tropical Medicine, University of Oxford. OVG develops new and improved vaccines for the prevention of infection in adults and children, enhancing the understanding of immunity and studying the epidemiology of infectious diseases.
Exhibitors

**British Society for Immunology** is a membership organisation that represents scientists and doctors who study the immune system. Our main objective is to promote and support excellence in research and clinical practice in immunology to benefit human and animal health and welfare.
www.immunology.org

**The British Society of Gene and Cell Therapy (BSGCT)** was founded in 2003 with the intention of providing a professional network for scientists and clinicians researching genetic disease and novel therapies. The BSGCT society membership is made up of hundreds of research scientists from PhD level to Professor.

**Viruses - from bad to good.** BUILD A VIRUS: Adenoviruses are used routinely in experimental research. Increasingly they are also being used clinically as vaccines, for gene therapy applications and even to help fight cancer. Our stand will allow you to build your own “customised” adenovirus, 1 million times bigger than the real thing.

**Pirbright institute** is a world leading centre of excellence in research and surveillance of viral diseases of farm animals and viruses that spread from animals to humans. Through fundamental and applied research, the Institute aims to ensure global health and wellbeing and economic and food security by improving understanding and control of viral diseases.
www.pirbright.ac.uk
Exhibitors

**Progress Educational Trust (PET)** -www.progress.org.uk - is a charity that informs public debate on genetics, embryo/stem cell research and assisted conception, and engages with policymakers and medical professionals to influence changes to law and regulation. PET believes this is important, because it creates an environment in which ethically sound research and practices thrive - for everyone’s benefit. We hold regular, free public events at which we welcome school parties. If you need to research a particular topic for an assignment, you should also check out PET’s flagship publication BioNews -www.bionews.org.uk - a weekly digest of news, comment and reviews read by around 18,000 people. You can subscribe to BioNews by email for FREE at www.bionews.org.uk/subscribe. Visit our stand today to win a Guide to Genetics in our Genius Quiz, and to enter our headline writing competition to win a £20 Amazon voucher. Facebook at www.facebook.com/ProgressEducationalTrust Follow us on Twitter @BioNewsUK

**The Veterinary Vaccinology Network** is a multidisciplinary community who aim to address the unmet needs in veterinary vaccinology, continuing in the fight against animal diseases and consequently those that have the potential to spread into humans. The network aims to enhance collaborations to design, develop and deliver safe and effective vaccines against new and (re)-emerging diseases. www.vetvaccnet.ac.uk

**Modernising Medical Microbiology** is working to find out more about bacteria and viruses in order to control and better manage them, ultimately improving people’s health. Using new technologies for reading the genetic code of microbes and in electronic information management, their work focuses on how infectious diseases are diagnosed, how infection is passed on, how we treat infections and how best to identify and control new outbreaks of infectious diseases. The research is likely to transform routine diagnosis, management and control of infectious disease in the coming years. The team’s work will also allow us to minimise the over-use of precious antibiotics. In turn this will reduce the incidence of antibiotic resistance and multi-resistance of bugs, reduce the risk of Clostridium difficile infections and provide cost savings in the NHS.
Floor Plan

Exhibitors
1. Virus/STOP-HCV
2. Nuffield Foundation’s Research Placement Scheme
3. The Jenner Institute
4. Oxford Vaccine Group
5. The British Society of Immunology
6. BSGCT
7. Viruses - from bad to good
8. The Jenner Institute
9. The Pirbright Institute
10. Progress Educational Trust
11. The Veterinary Vaccinology Network
12. Infections: Modernising Medical Microbiology