



# Big Biology Day 2014

## Our grateful thanks go to:

MedImmune for sponsoring Big Biology Day

Cambridge Science Festival for their continuing support

Hills Road Sixth Form College for hosting BBD for the third year



### **Parkside Federation Academies**

Ever wanted to have a go at dissection? Well here is your chance! You will be able to dissect chicken wings and pigs trotters, and investigate how muscles work in these limbs. Whilst you're here, why not also test your knowledge and try and put the organs back in our human body model?

### **Wellcome Trust – Medical Research Council Cambridge Stem Cell Institute**

Come and find out all about the amazing world of stem cells. You can look after your own flask of stem cells in our 'Stem Cell Pet' experiment, race to the finish line in our gigantic stem cell board game and talk to junior researchers working in the field about the latest advances.

### **Society of Biology**

*Biologists changing the world.* Come and find out about biology's unsung heroes! From those who studied life-saving drugs, to those who changed the way we do science, or saved species from extinction – Biology: Changing the World will tell you more. This is a Society of Biology stand, with games suitable for all ages.

### **LGC Group**

*The pipette challenge.* How do you know if an athlete takes a banned drug substance? How do doctors know what size tablet to give you when you are ill? At LGC, we measure drugs in blood and urine to help answer these questions. Come along to visit us and we will tell you how we do this. Then you can have a go yourselves and participate in the Pipette Challenge in the hope of showing us your skills and maybe winning a prize.

### **British Pharmacological Society and Biochemical Society**

We've all used a medicine at some point in our lives – paracetamol for a headache, an inhaler for asthma, antihistamine cream for a bite. But how do these medicines work, and how do scientists discover them? Join pharmacologists and biochemists from the British Pharmacological Society and the Biochemical Society to find out, and have a go at designing your own medicine.

### **Sainsbury Laboratory**

Can you create your own food from sunlight and thin air? Grow new body parts? Adapt your shape to local conditions? Plants can! Discover the fascinating world of plants with help from the researchers at the Sainsbury Laboratory.

### **British Society for Immunology**

*Germ Attack!* Germs are always ready to attack but your body has a secret weapon – your immune system! Find out how your immune system fights germs and what germs do to fight back. Visit our stand to discover all this and even have a go at designing your own immune cell or germ.

### **The Physiological Society**

The Hungry Games looks at the topic of obesity from a number of angles, exploring the hormones involved in appetite, BMI and risk factors associated fat distribution, and energy balance and weight management.

### **MRC Mitochondrial Biology Unit**

Everybody needs to eat to get energy for daily activities. A special compartment in human cells, the mitochondrion, breaks down food components and makes a cellular fuel called ATP. This uses the oxygen we breathe; sometimes, however, damaging oxygen radicals are formed, leading to illness and ageing. With the help of fun computer games, scientists from the MRC Mitochondrial Biology Unit will show how this happens.

### **Raptor Foundation**

The Raptor Foundation's aims have always been, firstly to rescue, rehabilitate and return injured birds of prey back to the wild and secondly to protect and preserve them through education and conservation. Learn about the vital work they do, see some of the magnificent birds and enjoy a flying display at 1pm.

### Long Road Sixth Form College

Come and explore the wonders of the human eye and how we see the world.

### Sanger Institute

What is DNA and how does it make us different from one another? How are computers and new technologies helping us to understand genomes? Hands-on activities for anyone from aged 6 years and over. You can make your own DNA sequence bracelet; see if you can sequence DNA as fast as a machine; sort data like a computer against the clock.

Scientists from the Wellcome Trust Sanger Institute will be on hand to help you with the activities and answer your questions.

### Babraham Institute

*Weapons of Microscopic Destruction – How your immune system keeps you safe from attack*

Your body is under attack!! All around you are pathogens – or germs – that cause disease: bacteria, viruses, parasites and fungi are in the air we breathe, the food we eat and on the surfaces we touch. Invading pathogens such as viruses can cause colds, flu and chicken pox.

But don't panic! Your body has developed an immune system, an army of specialist cells equipped with high-tech weapons and sophisticated communications systems that are ready for battle. Work with Babraham Institute scientists to identify potential invaders, explore how your immune system army detects and destroys them and build your own antibody! We will also investigate how your immune system changes as you get older – does it get better or worse with age?

### STEM Team East

*The Science of Butterflies.* Join STEM Team to learn how physics and biology work together to give butterflies their beautiful, colourful wings. These wonderful coloured wings have inspired scientists to research new methods of producing coloured paints and fabrics for the future. Join in and make a butterfly by a clever application of geometry!!

### Napp Pharmaceuticals

Come and make a brain hat and wear it with pride! Show the world what the different parts of your brain do to keep you ticking.

### GSK

Can you remove contaminated gloves in a safe manner? Would you be responsible for spreading a harmful substance onto everything you touch? Try the glove challenge to see your result.

Pharmaceutical companies can use X-ray crystallography and molecular modelling to help design new medicines. Come along to build a model of Ventolin or aspirin and see how crystal structures can be used in drug discovery. GSK were the laboratory service providers for the London 2012 Olympics. Try our Olympic anti-doping challenge to spot the cheats.

### Linnean Society

Come along and join the Battle of the Beaks! Choose to be Peggy Bird, Choppy Bird, Spooky Bird or Snippy Bird in our hands-on experiment, find out why some bird beaks look so weird, and discover more about evolution by natural selection.

### Chesterton Community College

*Amazing Plants.* What's in a plant? There's far more in a plant than meets the eye! How do plants work? Find out with hands-on exhibits - particularly suitable for younger family members. Our brilliant GCSE students are waiting to show you some amazing things about plants, such as: how to see onion skin cells & the tiny 'air holes' on the underside of leaves under the microscope; how plants suck up water & minerals to the top of the tallest trees; why some plants are carnivorous.

### Cambridge Infectious Diseases

Come and join a microscopic treasure hunt. Search for microbes and discover fascinating facts about microbiology with the Bug Battles team!

### **Dr Mike Leahy's Zoo-Bus**

Drawing from his experiences in the wildest parts of the world, both as a research scientist and TV presenter, and his passion for conservation and environmental issues, Dr Mike designed his Zoo-Bus as a way of sharing his enthusiasm for creatures and a place for fun. Meet close-up spiders, snakes, lizards, insects and much more, let Mike tell you about these fascinating animals and you may even get to handle the friendlier ones! The Zoo-Bus experience is the real “wow” factor and was hugely popular at BBD 2013. We're thrilled to have Mike with us again this year.

### **MedImmune**

Join MedImmune scientists in model experiments to show how we obtain our biologic medicines, like antibodies and proteins, from the cells that make them, and run tests to find out how much of the biologics we have made (quantity) and how good they are (quality).

### **British Science Association**

*Sherlock@Cambridge*. A murder has been committed at Hills Road Sixth Form College. Come along and help solve the crime by applying fun hands-on science with volunteer scientists from the British Science Association Cambridgeshire branch.

### **Hills Road Sixth Form College**

Come and meet Hills Road sixth formers who want to share their enthusiasm for biology with you. We'll show you how we can tell what an owl has had for dinner by dissecting and analysing an owl pellet contents and we'll challenge you in our mirror tracing task. You can enjoy our quizzes on arthropods, smells, identifying fruits and seeds and matching plants with their products. You can also make an articulating hand and try to identify some interesting biological specimens.

### **Society for General Microbiology**

Just because they are small, doesn't mean that microbes can't have super powers. Join the Society for General Microbiology to learn about some of the microbial world's most exciting and powerful members! You can build models to take away, watch animations and hear stories about three superheroes, all with extraordinary capabilities and who help to keep the human race alive and well.

### **Jeans for Genes**

Cystic fibrosis, Huntington's disease, Cri du Chat, Sickle cell anaemia and Duchenne muscular dystrophy. What do these conditions share? They're all due to our genes. Genetic disorders are rare but together they affect 1 in 25 children born in the UK - that's more than 30,000 babies each year. Genetic disorders are caused by an alteration in DNA. Jeans for Genes raises money for Genetic Disorders UK and aims to change the world for children with genetic disorders. Meet the staff and learn more about their vital work.

### **Stamford High School**

Learn more about woodlice. What do they like, what don't they like, how good are they in mazes and how fast can they run. Simple investigations which you could try at home.

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To discover more Society of Biology events in your area, visit [www.societyofbiology.org](http://www.societyofbiology.org)

Please remember to fill in your feedback form and drop it into the box or hand it to any of our volunteers – your feedback is valuable to us and will help us improve Big Biology Day next year.

**Thank you for your support and we hope to see you again next year!**