



9th International Conference on Biology and Synchrotron Radiation

13-17 August 2007

Bridgewater Hall, Manchester UK

www.bsr2007.com

Media Highlights

The 9th International Conference on Biology and Synchrotron Radiation brings together world-leading scientists to present the latest research in structural studies using synchrotron radiation – a light source that enables scientists to see the structure of small molecules in great detail. Historically, this technology has been responsible for our understanding of how energy is transferred around the body (through the discovery of the structure of the F1-ATPase enzyme), and for the development of the world's first neuraminidase inhibitor (Relenza™) to treat the flu virus. More recently, the use of synchrotron radiation has helped us to understand foot and mouth disease, SARS and photosynthesis, and has been instrumental in a number of drug discovery programmes.

These important discoveries are discussed in a number of lectures on Thursday 16th August, the penultimate day of the conference:

Thursday 16 August

David Stuart (Oxford, UK) opens with a plenary lecture about the challenges of structural virology. Stuart has led the way in research into the structural make-up of the foot and mouth virus, with the aim of developing effective methods to control the disease and avoid a repeat of the disastrous outbreak of foot and mouth disease in the UK in 2001. Other viruses studied by Stuart's group include the Bluetongue virus, a disease of sheep and cattle that can have devastating effect on herds, and cytoplasmic polyhedrosis viruses – insect viruses that have plagued the silk industry for centuries.

Lecture session 1 will include a presentation from **Zihe Rao** (Beijing, China) on SARS virus proteins. Rao is a leading researcher in the structural study of the SARS virus, bringing critical information to the global attempt to understand the SARS coronavirus, which was first identified in 2003 after the international outbreak of the disease. Rao had determined the largest number of protein structures from the virus within 6 weeks of the diagnosis of the first SARS patient.

The Thursday afternoon programme presents plenary lectures from Sir Tom Blundell (Cambridge, UK) and Keith Hodgson (Stanford, USA).



Blundell, co-founder of the drug discovery company Astex Therapeutics, will talk about how the understanding of protein structure can inform drug and vaccine design and development. Blundell is Head of the Biochemistry Department at Cambridge University and a world-leader in research on protein structure and function. He has pioneered many aspects of the protein structure field and is an authority on structure-based drug design and protein bioinformatics. He has also played an active role in UK national science policy in appointments as Director General of the Agriculture and Food Research Council (1991-1994) and Chief Executive of the Biotechnology and Biological Sciences Research Council (1994-1996). Tom has also recently appeared on BBC Radio 4's Desert Island Discs (http://www.bbc.co.uk/radio4/factual/desertislanddiscs_20070603.shtml)!

Hodgson, director of Photon Science at the Stanford Linear Accelerator Center, will speak about new developments in x-ray laser technology used to discover the structure of proteins. Currently proteins must be crystallised before they can be determined structurally, a process that often takes months or even years. Hodgson has been instrumental in developing a pioneering technology that is hoped to enable researchers to image the structure of molecules in solution without the need for crystallisation. Such a breakthrough would have a huge impact on the fields of structural biology and biochemistry, with knock-on effect on the drug discovery process.

The day concludes with a special plenary lecture from Nobel Laureate **Johann Deisenhofer**. Deisenhofer was jointly awarded the Nobel Prize for Chemistry in 1988 for his work with Hartmut Michel on the structure of the photosynthetic reaction centre of *Rhodospseudomonas viridis*. The work of Deisenhofer and Michel has enhanced our understanding of the mechanisms of photosynthesis. Understanding such a process could greatly inform our efforts to develop alternative energy sources. Deisenhofer will speak about synchrotron radiation – where we are now, and where it could take us in the future.

Other highlights of the conference include:

Monday 13 August

The study of **Structural Genomics** is an exciting field of biological research that moves us an important step beyond the knowledge gained through the Genome Project. By working out the structure of every protein in an organism (the whole proteome) scientists hope to facilitate our understanding of the complex systems and mechanisms by which our bodies function and thus gain a better understanding of diseases and disorders.

Two of the largest Structural Genomics programmes in the world are based in the US and Japan, and the opening plenary lecture of the conference will be given by **Shigeyuki Yokoyama**, Project Director of the RIKEN Genomic Sciences Centre Protein Research Group, Japan. Yokoyama will talk about the changing face of Structural Genomics and what it means for drug design and biotechnology.



The following session on Structural Genomics/Proteomics will include a presentation by **Stephen Burley**, CSO and Senior VP, Research, of SGX Pharmaceuticals. SGX (formerly Structural GenomiX) is a biotechnology company focused on the discovery and development of innovative cancer therapeutics. SGX has a number of promising drugs in its oncology pipeline.

Tuesday 14 August

The second day of the conference presents a number of lectures relating to structural studies of **ion channels**. The understanding of how ions (salts) are transported in and out of cells is crucial to our understanding of heart disease and how to prevent and cure it.

In the afternoon, **Jim Barber** (Imperial College, London) will present a lecture titled 'PSII'. Barber specialises in photosynthesis – a process whereby light energy is absorbed by chlorophyll in plants to split water. Barber intends his research to lead to the development of new energy sources for the future, and also to engineer new crops that are able to survive in hostile environments.

The closing plenary lecture of the day will be given by **Venki Ramakrishnan** (MRC, Cambridge, UK). Ramakrishnan was awarded the Louis Jeantet Prize for Medicine this year for his research on the ribosome. The ribosome plays an important role in our battle against disease, being one of the main targets of antibiotics. The studies carried out by Ramakrishnan are therefore crucial at a time when bacterial resistance to these drugs has become a major public health concern. Ramakrishnan's work should lead to the improvement of certain antibiotics and potentially to the development of new ones.

Wednesday 15 August

Wednesday sees a session dedicated to the **industrial applications** of synchrotron radiation, which includes lectures from David Brown (Pfizer), Michelle Browner (Roche), Harren Jhoti (Astex Therapeutics) and Charles Lesburg (Schering-Plough).

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