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Diffraction structural biology – introductory overview

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An introductory overview to the special issue papers on diffraction structural biology in this issue of the journal.

This issue of the *Journal of Synchrotron Radiation* presents articles submitted in the context of the 3rd International Symposium on Diffraction Structural Biology (ISDSB2010) (http://www.synchrotron-soleil.fr/workshops/2010/ISDSB). It was the third in the series of ISDSB symposia initiated in 2003 by the Japan Society for the Promotion of Science (JSPS) and specifically by the University–Industry Cooperative Research Committee (#169) chaired by Professor Noriyoshi Sakabe. This conference, the first outside of Japan, was held in France, close to Paris, on 25–28 May 2010 at Paris-Sud University (Orsay) and at the synchrotron radiation facility SOLEIL (Saint Aubin).

The historical concept of the ISDSB symposia is, firstly, to bring together researchers using diffraction and crystallography, and more generally interactions of X-rays, electrons and neutrons with matter, in the study of structural biology, and, secondly, within this domain, to facilitate the interaction between academic and industrial researchers. The interfaces with other active fields in biological ultra-structure using microscopies and spectroscopies (in particular NMR) are also respected as vital for the growth of a more systematic understanding of biological function based on structure. The scientific topics covered in ISDSB2010 included the following sessions: electron microscopy, X-ray imaging and tomography; drug and vaccine design; protonation states; large biomolecules; membrane proteins; protein structure/function; X-ray technologies; and structural genomics. Overall, the symposium provided a far-reaching picture of the latest achievements and trends of structural biology at all relevant length scales (from molecular to cellular) and time scales. A total of 201 participants, with a number of young scientists and PhD students, from 18 countries took part. The speakers included one Nobel Prize winner, Venki Ramakrishnan, seven plenary lecturers (Wolfgang Baumeister, Tom Blundell, Gérard Bricogne, Wayne Hendrickson, Claudio Luchinat, Dmitri Svergun and Ichiro Tanaka) and 26 invited session lecturers. There were two poster sessions and also a Commercial and Industrial Companies Exhibition as well as a visit to the SOLEIL facility (the symposium program and poster sessions are available online as supplementary material). A special feature was a 'Meet the Public' event hosted by SOLEIL and the Director General, Professor Michel van der Rest, involving a panel comprising the Nobel speaker and the plenary speakers. Topics emphasized by the panel included the prime importance of basic science, whilst recognizing the need for applied science, as well as the role and importance of the large facilities such as synchrotron and neutron sources. Contributions 'from the floor' included the image problem that science has with the public in being, for example, unable to respond promptly to disease challenges and the need to talk up the long lead time of basic science breakthroughs to actual applications (see extracts in http://www.synchrotron-soleil.fr/Presse/Videos/ISDSB2010).

The symposium was supported jointly by the Research Committee #169 of JSPS and by various french institutions and industrial companies. Best bursary applications were invited for funds supported by the European Crystallographic Association and International Union of Crystallography.

The fourth symposium of ISDSB will be held in Japan, probably in 2013, and will be chaired by Professor Takashi Yamane.