s1.m7.p13 **Structure of photosystem II and architecture of the oxygen evolving centre.** So Iwata, *Imperial College London, Biological Sciences, Exhition Rd. London, UK. E-mail: s.iwata@ic.ac.uk*

Keywords: Membrane protein; Photosystem II; Crystal structure

Photosynthesis utilises light energy to oxidizing water molecules into molecular oxygen at the oxygen-evolving center (OEC) of photosystem II (PSII). We will report the crystal structure of PSII of the cyanobacterium *Thermosynechococcus elongatus* at 3.5 angstrom resolution. We completed and refined the structure model of this 650 kDa dimeric multisubunit complex. The structure revealed details of the cofactor environment including the structure of the OEC. Anomalous difference Fourier maps, calculated using long wavelength data, were used to identify the metal ions within the OEC, which contains a Mn_3CaO_4 cluster linked to a fourth Mn ion. The details of the surrounding coordination sphere of the metal cluster and the possible oxygen-evolving mechanism will be discussed.

s1.m7.p14 **Light driven conformational changes in a bacterial photosynthetic reaction centre.** Gergely Peter Katona, Ulf Andréasson, Pontus Gourdon, M. Ehud Landau, Arjan Snijder, Örjan Hansson, Lars-Erik Andréasson and Richard Neutze, *University of Leicester, Department of Biochemistry, University Road, Adrian Building, Leicester, UK. E-mail: gpk1@le.ac.uk*

Keywords: Photosynthesis; Intermediate trapping; Membrane proteins

Photosynthetic reaction centres (RCs) are primarily responsible for conversion of light-energy into chemical energy within the biosphere. Reaction centres from the purple bacteria *Rhodobacter sphaeroides* contain three subunits (H, L and M) which fold to create an eleven transmembrane α-helix scaffold supporting four bacteriochlorophyll, two bacteriopheophytin, two ubiquinone (Q), and one iron co-factor. Absorption of a photon by a special pair of strongly interacting bacteriochlorophylls (P_{870}) leads to the transfer of an electron, via a tightly bound ubiquinone (Q_A), to a mobile ubiquinone (Q_B). P_{870} is subsequently reduced from the periplasm by cytochrome c_2 and a second photon absorption yields a second electron transfer reaction, whereupon UQ_B^{2-} is protonated from the cytoplasm and released into the membrane. In bright light, however, an electron becomes stabilised on Q_A^- in the absence of Q_B. Here we report the lipidic cubic phase grown crystal structure of reaction centre from *Rhodobacter sphaeroides*. The RC crystals were illuminated with bright light at cryogenic temperatures, revealing a subtle conformational change primarily associated with the cytoplasmic domain of the H-subunit. These findings suggest a role for the H-subunit regulating the rate of electron transfer from Q_A^- and thereby avoiding repeated and potentially damaging charge recombination reactions at the special pair.