s6.m20.p7 **Photosystem II reaction centres: isolation, reconstitution and crystallisation.** Zupcanová A. [a,b], Vácha F. [a,b], Kutá Smatanová I. [a], [a]*Institute of Physical Biology USB CB & Institute of Landscape Ecology AS CR, Zamek 136, 373 33 Nove Hrady, Czech Republic;* [b]*Institute of Physical Biology USB CB, Zamek 136, 373 33 Nove Hrady, & Institute of Plant Molecular Biology AS CR, Branisovska 31, 370 05 Ceske Budejovice, Czech Republic*. *E-mail: zupcanova@greentech.cz*

Keywords: Photosystem II; Reaction centre; Crystallisation

The photosystem II is a membrane pigment-protein complex consisting of over 17 subunits. It can be divided in three parts according to its function: 1. the reaction centre (RC); 2. inner and outer light harvesting complexes and, 3. the oxygen-evolving complex. RC is a minimum unit capable of charge separation between the primary electron donor (chlorophyll molecule) and primary electron acceptor (pheophytin), followed by stabilisation of separated charge by transfer of electron to plastoquinone. RC of photosystem (PS) II consists of five protein subunits (D1, D2, α and β subunits of cytochrome b-559 and PsbI). The heterodimer of D1 and D2 binds six chlorophylls, two pheophytins, two β—carotenes, two plastoquinones denoted QA and QB, respectively, and one iron atom.

The five-chlorophyll reaction centre of photosystem II (5-Chl RC PSII) was isolated from green pea (*Pisum sativum*), purified according to Vacha [1] and reconstituted with purified chlorophyll a as described in [2]. Freshly isolated and frozen samples of 5-Chl RC PSII concentrated to 15-mg/ml (1.3?mg/ml chlorophyll a) were subject of crystallization assays using the counter-diffusion technique implemented in single capillaries [3] and traditional sitting drops. Different types of precipitants and detergents and different pH values were tested experimentally. Optimal values (pH 7.00 and PEG4000 as a precipitant) have been already found. N-dodecyl-β-D-maltoside (DM) was found as acceptable detergent. Possible green crystals were tested at synchrotron in Grenoble (beamline ID14-1) at 100K. Crystallisation experiments on PSII membrane protein complexes are still in the progress.

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s6.m21.p1 **Intra-atomic spin distribution probed by X-rays.** H Adachi, *Institute of Materials Structure Science, KEK, Japan. E-mail: hiromichi.adachi@kek.jp*

Keywords: Spin density; Synchrotron radiation; Magnetic diffraction

We show the x-ray diffraction technique to measure atomic spin form factors. While the neutron diffraction technique can probe the microscopic magnetisation including the component arising from the orbital motion of the electrons, the present technique can solely probe the spin polarisation. In addition, this technique provides the form factors in the case that the quantisation axis of the electrons in target materials is parallel to the scattering vector. The form factors in this geometry cannot be measured by the polarised neutron diffraction, because the scattering cross section vanishes, but they are very easy to analyse thanks to the mathematical simplicity and have physically transparent meaning [1]. In the presentation, the significance of the present technique in comparison with the conventional neutron one will be further discussed. Some of our recent experimental results on rare-earth dialuminides will be also shown, where the asphericity of the spin distribution around the rare-earth ions is clearly observed [2].

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