



	Experiment title: Structure analysis of light-responsive and human disease related proteins	Experiment number: MX-539
Beamline: ID 29	Date of experiment: from: 17/05/07 to: 18/05 /07	Date of report: 15.02.08
Shifts: 3	Local contact(s): Dr Xavier THIBault	<i>Received at ESRF:</i>
Names and affiliations of applicants (* indicates experimentalists): Azat Gabdulkhakov*, Albert Guskov* and Wolfram Saenger Institut für Chemie/Kristallographie, Freie Universität Berlin, Takustr.6, D-14195 Berlin Norbert Krauß Institut für Biochemie, Universitäts-Klinikum Charité' der Humboldt-Universität Berlin, Monbijoustr.2, D-10117 Berlin		

Report:

Photosystem II (PSII) is multisubunit complex embedded in the thylakoid membrane of higher plants, algae and cyanobacteria that catalyzes the oxidation of water to atmospheric oxygen.

So far the highest resolved structure of PSII with resolution of 3Å was obtained in the previous proposal period MX-335. But there is strong need to obtain higher resolution structure to overcome limitations of current model.

Apart from improving the preparation and crystallization of dimeric PSII, we have isolated PSII monomer that is enzymatically as active as dimer and shows the same subunit composition.

The aim of this experiment was a data collection with Helium cryostat to cool down crystals to lower temperatures to decrease radiation damage. To avoid crystal vibrations we used special strong loops. A negligible ice formation was observed. We used temperature range between 15K-48K.

Data statistics is shown below:

Space group C2221 a=120.8 b=223.7 c=340.0	
Wavelength [Å]	0.976
Resolution [Å]	50-3.9

Rsym	0.089(0.473)
Completeness [%]	95.1
I/sigma	10.33 (2.68)
Number of observations	142687
Number of unique	40310

For comparison we collected dataset under typical conditions (100K, Nitrogen cryostream) with the most similar crystal, data statistics is shown below:

Space group C2221 a=120.5 b=222.5 c=339.8	
Wavelength [Å]	0.976
Resolution [Å]	50-3.9
Rsym	0.114(0.496)
Completeness [%]	92.4
I/sigma	8.23 (2.78)
Number of observations	154483
Number of unique	38506