

Proposal Report.

Proposal Code MX- 770

Proposal Title Structural studies on the recombinant protein PsbP from *Spinacea oleracea*

Preliminary X-ray diffraction analysis of the extrinsic PsbP protein of photosystem II from spinach (*Spinacia oleracea*) was performed using N-terminally His-tagged recombinant PsbP protein overexpressed in *Escherichia coli*. Recombinant PsbP protein (thrombin-digested recombinant His-tagged PsbP) stored in bis-Tris buffer pH 6.00 was crystallized using the sitting-drop vapour-diffusion technique with PEG 550 MME as a precipitant and zinc sulfate as an additive. SDS-PAGE analysis of a dissolved crystal showed that the crystals did not contain the degradation products of recombinant PsbP protein. PsbP crystals diffracted to 2.06 Å resolution in space group P2(1)2(1)2(1), with unit-cell parameters $a = 38.68$, $b = 46.73$, $c = 88.9$ Å.

The structure was solved by molecular replacement with MOLREP in CCP4 using the structure of *Nicotiana tabacum* PsbP protein (PDB: 1v2b) as a search model. R_{work} and R_{free} for the final model are 18.1% and 23.3%, respectively. The data are deposited with PDB accession code 2vu4. Structure provides the first complete structural picture of this key protein.

Results are presented in two papers:

1. Kopecky V Jr, Kohoutova J, Lapkouski M, Hofbauerova K, Sovova Z, et al. (2012) Raman Spectroscopy Adds Complementary Detail to the High-Resolution X-Ray Crystal Structure of Photosynthetic PsbP from *Spinacia oleracea*. PLoS ONE 7(10): e46694. doi:10.1371/journal.pone.0046694.
2. Kohoutová J, Kutá Smanánová I, Brynda J, Lapkouski M, Revuelta JL, Arellano JB, Ettrich R. (2009). Crystallization and preliminary crystallographic characterization of the extrinsic PsbP protein of photosystem II from *Spinacia oleracea*. Acta Crystallogr Sect F Struct Biol Cryst Commun . 65(Pt 2):111-5.