cost TD1102
PHOTOTECH: BIOSENSORS & BIOCHIPS

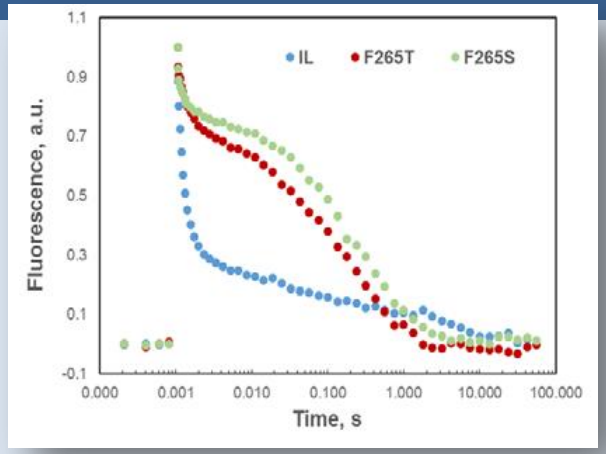
Short Term Scientific Mission

TD1102-15127

Project: Biophysical study of PSII electron transport efficiency in *Chlamydomonas* mutants.

Grantee: Maya Dimova Lambreva
Institute of Crystallography, CNR, Via Salaria, Km 29.300
00015 Monterotondo (RM), Italy
tel: +39 0690672921
fax: +39 0690672630

Period of STMS: 30.09.2013-02.11.2013
Host institution: Department of Biochemistry and Food Chemistry, University of Turku, FI-20014 Turun Yliopisto, Finland
Mentor: Prof. Esa Tyystjärvi (esatyy@utu.fi)



Decay of variable fluorescence yield in reference strain, IL, and F265T and F265S D1-mutants, measured at room temperature.

Aims & subject of work

The main goal is to probe the atrazine sensitivity of two side directed D1-mutants of Chlamydomonas reinhardtii, in which Phe265 is substituted by threonine and serine. By computational analyses it was predicted that these aminoacid substitution may increase binding affinity of the PSII QB pocket toward atrazine. In addition, research is focused on unravelling of the effect of the single point mutations on the efficiency of the Photosystem II electron transport.

Argumentation of necessity of STSM

The acquired knowledge is to be applied for rational design of photosynthetically efficient and stable strain as novel bio-recognition elements in biosensor devices.

Workplan/timeschedule followed

- registration of decay of fluorescence yield induced by a single turnover flash in presence of different concentrations of atrazine and different temperatures.
- registration of electron transport rate, photochemical and non-photochemical quenching of chlorophyll a fluorescence signal during exposure to different intensities of actinic light.
- registration of oxygen evolution rate under saturated light intensities in presence of different concentrations of atrazine.

Main results and outcome (conclusions):

The super-sensitivity of the F265T and F265S D1-mutants toward atrazine foreseen by the computation analyses utilized for the rational design of these mutants was documented. The accumulated experimental data provided insights into the alteration of PSII performance and functioning induced by single amino acid substitution into QB binging niche of D1 protein.