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PHOTOTECH: BIOSENSORS & BIOCHIPS

Short Term Scientific Mission 11944&12262

Project: Analyses of thermoluminescence glow and oxygen evolution kinetics in *Chlamydomonas* strains

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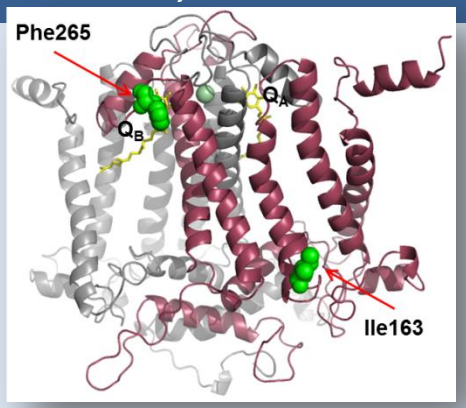

Photosystem II D1/D2 heterodimer showing the relative position of Ile163 and Phe265 residues

Aims & subject of work

The aim is to identify the role of single amino acid substitutions in PSII D1 protein of *Chlamydomonas* strains in their capability to deal with stressful conditions. The research is focused on functional characterization of PSII by registering thermoluminescence glow curves and kinetics of oxygen-evolving reactions. Both methods provide comprehensive information about the efficiency of the PSII photochemistry and offer useful criteria for the functional characterization step of the bio-recognition element.

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 thermoluminescence emission.
- registration of yields of the O_2 production using saturating flashes and O_2 evolution burst after excitation with continuous.

Main results and outcome (conclusions):

The results indicated that the mutation introduced near to the PSII redox-active Tyr161 (I163N) may stabilize PSII charge separation, while the alteration in the composition of the Q_B binding pocket (F256T and F265S) lead to noticeable impairment of the Q_A to Q_B electron transfer. Peculiarities of the PSII performance in selected strains and their suitability as bio-recognition elements was estimated.