

Microdomains of pigment-proteins in thylakoids during high-light stress in *Synechocystis* sp. PCC 6803 - physiology and proteins organization

Myriam Canonico

Laboratory of Photosynthesis, Centre Algatech, Institute of Microbiology CAS, TŘEBONĚ

Cyanobacteria are model organisms to study structure and function of photosynthetic machinery. The light reactions of oxygenic photosynthesis take place in thylakoid membranes that are specialized membrane systems located in the stroma of chloroplast or in the cytoplasm of cyanobacteria. The organization of pigment-protein complexes (PPCs), namely PSI, PSII and phycobilisomes, has been described as heterogeneous mosaic like structure (Strašková et al., 2019, *subm.*). Basic behavior of this organization has been recently described (Konert et al., 2019) by a new parameter, Proteins Arrangement factor (PA-factor) reflecting ratios of PPCs and their co-localization in thylakoid membranes during high-light stress. In the presentation, the previously observed 4 phases of acclimation during 6 hours of high-light will be further characterized by other techniques (absorption spectra, 77K fluorescence, DUAL-PAM, confocal microscopy and protein electrophoresis) that allow us to study protein content and physiology of the cells together with organization of PPCs in the thylakoid membrane. The combined experimental approach has allowed us to discuss physiological significance of PPCs organization during the high-light treatment.

References:

Konert G, Steinbach G, Canonico M, Kaňa R (2019) Protein Arrangement (PA) factor: a new photosynthetic parameter characterizing the organization of thylakoid membrane proteins. *Physiol Plantarum* *accepted*

Strašková A, Steinbach G, Kotabová E, Komenda J, Tichý M, Kaňa R (2019) Pigment-protein complexes are organized into stable microdomains in cyanobacterial thylakoids. *BBA - bioenergetics* *submitted*