

## Molecular regulatory mechanisms of the photosynthetic antenna function in plants

Life on our Planet is fueled by energy of sunlight but not all organisms, in this number humans, are able to utilize directly energy of electromagnetic radiation to drive biochemical reactions. On the other hand, such energy can be captured and converted to the generally accessible forms in the Biosphere, by photosynthesizing organisms, including terrestrial plants. During the biological evolution plants developed several regulatory mechanisms which help them to optimize absorption and utilization of energy of light. Among such processes are the phototropic movement of leaves and entire plants, translocation of chloroplast within a cell and also diffusion of chlorophyll-containing pigment-protein complexes, in the chloroplast membranes. The results of scientific observations suggest that this type of regulation extends also to the molecular level. Management of light energy in the photosynthetic apparatus is not only important from the standpoint of maximization of energy capture. Absorption of high number of photons, above the level which can be instantaneously used to drive photosynthetic reactions, is associated with a serious risk of photo-oxidative damage of a plant. Owing to this fact, knowledge on regulatory processes operating in photosynthesizing organisms to manage excitations, can be crucial in selection and engineer crop plant varieties resistant to stress conditions associated with high light. Unfortunately, exact molecular mechanisms responsible for such a regulation are still not fully understood. Within the present project, research activity will be directed towards unveiling some mechanisms, operating at a level of single pigment-protein complexes, to optimize utilization of excitation energy.