

SEMINAR: Structural and functional diversity of pigments in light-harvesting complexes from eukaryotic photosynthetic organisms

SOICHIRO SEKI

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12:00 to 13:00

Elements Room

BIO

Dr. Soichiro Seki is a Japanese researcher specializing in photosynthesis, biophysics, plant molecular physiology, and structural biochemistry. His research focuses on how photosynthetic organisms capture and use light through pigment-protein complexes known as photosynthetic antennae, especially light-harvesting complex II, or LHCII.

He is affiliated with the Institute for Protein Research at Osaka University, where he is listed as a Specially Appointed Assistant Professor. His research keywords include photosynthesis, LHCII, chlorophyll, carotenoids, cryo-electron microscopy, in vitro reconstitution, protein design, and green algae.

ABSTRACT:

Light-harvesting complexes (LHCs) are essential components of photosynthesis, enabling efficient solar-energy capture while also regulating the dissipation of excess excitation energy. Eukaryotic photosynthetic organisms have evolved diverse pigment compositions and arrangements, including variations in pigment chemical structures, conformations, and binding positions within protein scaffolds. This pigment diversity allows photosynthetic organisms to adapt to a wide range of light environments on Earth. However, the structural complexity of pigment-binding patterns has made it difficult to define how individual pigments function and how their spatial organization is controlled by the surrounding protein matrix. In recent years, we have determined high-resolution cryo-electron microscopy structures of LHCs from multiple natural organisms, as well as from an in vitro reconstituted recombinant system. These studies provide structural bases for understanding how pigment diversity contributes to spectral tuning, excitation-energy transfer, and energy dissipation in eukaryotic light-harvesting systems.

Hosted by: Prof. Dr. Nicoletta Liguori