

FDITE01 Molecular Biophysics of Photosynthesis

(P. Maróti)

Description:

The course approaches photosynthesis from a molecular biophysics' perspective, with particular emphasis on the processes of electron transfer and energy transfer, illuminated by structure-function relationships.

Topics:

Light Energy Capture and Energy Transfer

Pigment–Protein and Excitonic Pigment–Pigment Coupling in Photosynthetic Light-Harvesting Complexes

Photosynthetic Energy Transfer and Charge Separation in Higher Plants

Underlying Principles of Electron Transport

Energy Changes in Photosynthetic Electron Transport: Probing Photosynthesis by Pulsed Photoacoustics

Separation and Stabilization of Charge

Mechanism of Primary Charge Separation in Photosynthetic Reaction Centers

Effects of Quasi-Equilibrium States on the Kinetics of Electron Transfer and Radical Pair Stabilisation in Photosystem I

Donor Side Intermediates and Water Splitting

The Radical Intermediates of Photosystem II

Water and Oxygen Diffusion Pathways Within Photosystem II. Computational Studies of Controlled Substrate Access and Product Release

Evolution of the Photosynthetic Apparatus

Origin of Oxygenic Photosynthesis from Anoxygenic Type I and Type II Reaction Centers

Recommended literature:

John Golbeck, Art Est: The Biophysics of Photosynthesis, Springer Verlag, 2014.