Title: Structure-function relationships in photosynthetic membranes: Challenges and Emerging Fields

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Review:

Structure-function relationships in photosynthetic membranes:

Challenges and Emerging Fields

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Highlights:

- The structure of photosynthetic membranes is highly responsive to environmental conditions, constantly changing their shape.
- Switching the supramolecular arrangement of photosystem II from a disordered to semi-crystalline state control lateral diffusion and light harvesting in thylakoid membranes.
- Dynamic changes in physicochemical properties of the lipid bilayer can control the conformation and supramolecular organization of proteins in photosynthetic membranes.

Abstract

Oxygenic photosynthesis is a fundamental biological process that shaped the earth's biosphere. The process of energy transformation is hosted in highly specialized thylakoid membranes that adjust their architecture in response to environmental cues at different structural levels leading to the adjustment of photosynthetic functions. This review presents structure-function dynamics ranging from the whole membrane system over the mesoscopic level (protein ensembles) down