# Creating an Artificial Photosystem in Phospholipid Bilayers

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In natural photosynthesis, light harvesting and the transfer of electrons across membranes is especially important.[1] We are mimicking natural photosynthesis by implementing chromophores in a strictly ordered fashion into phospholipid bilayers. In our studies these chromophores absorb high-energy light and transfer the energy to a photoredox chromophore, which, in the excited state, performs catalytic reduction of a model substrate using external sacrificial electron donors.

The precise alignment of chromophores is crucial in nature's photosystem I and II, both for light harvesting and light-induced electron transfer and catalysis. We proof the precise alignment in our artificial system by means of luminescence, absorbance spectroscopy, and confocal microscopy on giant vesicles. Energy transfer, followed by photocatalysis will be demonstrated.

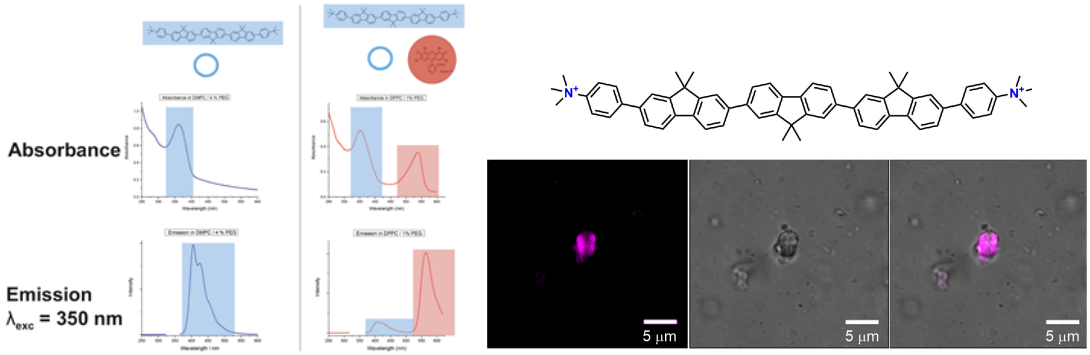


Figure 1: Left Spectroscopy and light-energy transfer of the wires in phospholipid bilayers. Right: confocal microscopy images of giant vesicles.

[1] a) N. Nelson, C. F. Yocum, Annu. Rev. Plant Biol. **2006**, *57*, 521–565.b) R. E. Blankenship, Molecular Mechanisms of Photosynthesis, Wiley Blackwell, **2014**.