# Efficient Conversion of Solar Energy to Electricity and Fuels

## Quantum Dot-Based Energy Transfer to Surface Molecules

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This study aims to elucidate the underlying factors of the energy transfer process at the quantum dot interface with steady-state and femtosecond time-resolved spectroscopy techniques. Quantum dots show high quantum yields, narrow emission and broad excitation spectra, resistance to photobleaching and long-lived excited states needed for sensitization via energy transfer. CdSe quantum dots and their conjugates with surface attached energy acceptors were prepared and energy transfer efficiencies and dynamics were studied by steady-state and femtosecond time-resolved spectroscopy. We studied the effect of various parameters such as spectral overlap integral, linker chain length and linker chain bulkiness, as well as chemical functionality on the energy transfer. It was observed that the observed quantum dot based energy transfer can not be explained based on purely on Foerster Energy Transfer theory alone, but that in addition the involvement of Quantum Dot surface states play an important role.

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