The Synthesis and Photophysical Study of Porphyrin-Fullerene Dyads: New Results from the NYU Fullerene Group

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There has been considerable interest directed toward the synthesis and study of hybrid compounds in which a fullerene cage is covalently linked to a light-absorbing chromophore. Such dyads containing a porphyrin moiety have proven of particular interest for their interesting biological properties and medicinal potential. Photoinduced electron transfer, where the fullerene cage accepts an electron to form a charge-separated state following excitation of the porphyrin moiety, mimics the process of photosynthesis in plants. In a competing reaction, these dyads photosensitize the formation of singlet molecular oxygen *via* fullerene triplet excited states, making them prospective candidates for photodynamic therapy (PDT) against tumors (see Figure 1). Current efforts in our laboratory are directed at the synthesis of a variety of porphyrin-fullerene dyads with exotic linkages and the photophysical study of these hybrids using UV-vis, near IR, fluorescence, and transient absorption spectroscopy. In this presentation, we report our latest results in this area.

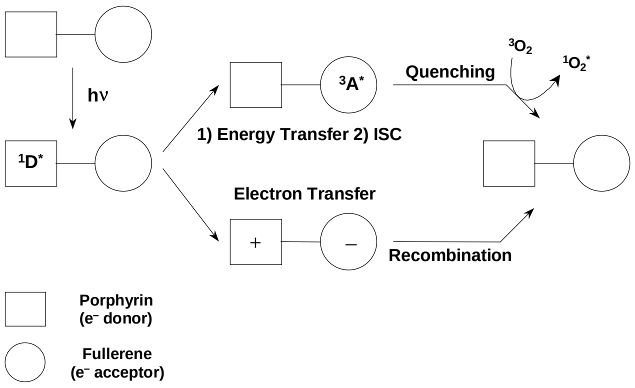

Figure 1. A schematic representation of the competing photophysical pathways following irradiation of fullerene-porphyrin dyads.