

**Photodynamic Effect and
Photostability of Hydrophilic
Hexa(sulfobutyl)fullerene (FC₄S)**

- C. Yu (Pathology and Laboratory Medicine, Mount Sinai Hospital and University of Toronto), T. Canteenwala (Center for Condensed Matter Sciences, National Taiwan University), K. Pritzker (Pathology and Laboratory Medicine, Mount Sinai Hospital and University of Toronto), B. Wilson (Medical Biophysics, Ontario Cancer Institute and University of Toronto), and L. Chiang (Department of Chemistry, University of Massachusetts Lowell)

Application of photodynamic therapy (PDT) for tumor destruction has been studied extensively as an alternative approach to radio- and chemotherapy against malignant cells. The most commonly used sensitizers for clinical PDT practices are Photofrin II, an enriched active fraction of hematoporphyrin derivatives, and disulfonated aluminum phthalocyanine (AlS₂Pc). Photodynamic effect of fullerene derivatives, such as polyethylene glycol-conjugated C₆₀ (PEG-C₆₀) and micelle-like hydrophilic hexa(sulfobutyl)fullerene (FC₄S) were examined by intravenous injection of the substance showing a suppressive effect on the tumor growth as reported. Photogenerated triplet C₆₀ intermediate is involved in the energy transfer process that converts the ground-state triplet oxygen molecules into the excited molecular singlet oxygen ¹O₂. Direct detection of singlet oxygen (¹O₂) upon photoirradiation of FC₄S in the presence of oxygen was achieved by its photoemission at 1270 nm indicate

inefficient energy transfer from triplet FC₄S to triplet oxygen in producing the corresponding singlet oxygen species. High stability of FC₄S against photobleaching than that of Photofrin was observed.