

SPM1-1

Biomedical Imaging and Therapy Applications of Nanoparticles

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The potential use of quantum dots (QDs) and QD-conjugates as sensitizers for photodynamic therapy (PDT) agents will be discussed in this presentation. The photoinduced singlet oxygen generation in relation to QD-based energy transfer is assessed by studying the interaction between CdSe QDs with a known silicon phthalocyanine PDT photosensitizer, Pc4. Furthermore we have evaluated the effect of various structural changes on the energy transfer from the QDs to a series of phthalocyanine analogues by steady state and femtosecond time-resolved spectroscopy. Our results suggest that non-Förster-type energy transfer might be occurring between the QD-phthalocyanine donor-acceptor pairs. Examples of surface mediated energy transfer will be presented. Also the use of nanoparticles for drug delivery is discussed.