

Free and poly-methyl-methacrylate-bounded BODIPYs for photodynamic therapy

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ABSTRACT

PDT is a minimally invasive therapeutic regimen in which the combination of a photosensitizer (PS), oxygen and light enables the production of reactive oxygen species (ROS) inducing cancer cell death. Despite PDT in vitro and in vivo applications are growing, its use in clinical oncology is still limited, mainly due to phototoxicity, PSs' synthesis complexity and suboptimal tissue penetration. As for chemotherapy, the design of efficient drug delivery systems represents a major challenge in PDT. Hence, the synthesis and characterization of new PSs or new nanoparticles are actively pursued by many research groups. In this work, we describe the synthesis of two new positively charged BODIPY derivatives as well as their electrostatic loading onto negatively charged poly-methyl methacrylate core-shell nanoparticles. We also show, in a panel of cancer cell lines, preliminary results about the effects of free or NP-bounded BODIPYs on cell viability, on ROS and ¹O₂ and on the percentage of apoptotic and necrotic cells. Our data indicate that these NPs might represent an interesting way to deliver PSs for PDT and an option worth investigating.