

Characterization of MPA79 a novel two-photon photosensitizer

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Two-photon excitation photodynamic therapy (TPE-PDT) is being investigated as a potential new treatment and has many advantages over one photon PDT. MPA79 is a derivative of hematoporphyrin and was synthesized specifically to have a large two-photon cross-section. Both one-photon and two-photon spectral characterization was performed to determine if this new photosensitizer is appropriate for use as a TPE-PDT drug. Previous studies have shown that liposomes are an excellent tool to study photobleaching due to the hydrophobic properties of many porphyrin-derived photosensitizers. Different liposome compositions were evaluated in order to choose the best lipid for further study. DOPC liposomes were consequently used in optical trapping and photobleaching studies. The efficiency of a photosensitizer can be evaluated by determining the apparent kinetic rate constants of photobleaching. It appears that MPA79 is an excellent two-photon absorber but there is a large problem with solubility, thus making it difficult to use as a drug.