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Title: AB3 Type Asymmetric Phthalocyanines: Solid-Phase Synthesis and Possible Applications.

Abstract: Phthalocyanines (Pcs) are excellent candidates for use as fluorophores in bioanalytical applications and as photodynamic therapy (PDT) agents. For a number of uses including covalent labeling, it would be advantageous to be able to readily prepare Pcs with two or more different substituents on the exterior of the Pc core. For example, an asymmetrically substitued Pcs with one functional group for use in the labeling reaction, while the other substitutents provide for improved solubility of the molecule in aqueous solution would be useful dyes for near-infrared fluorsecent tagging of biomolecules. Synthesis of phthalocyanines (Pcs) with asymmetrical substitution on the periphery is often difficult due the problems in purification of the Pc mixtures obtained. Utilizing a hydrophilic, polyethylene glycol-based support with different types of linkers, we have developed the synthesis of monohydroxy and monoamine functionalized oligoethylene glycol substituted Pcs via a solid-phase phthalonitrile tetramerization reaction. The use of the hydrophilic support allows symmetrical Pc product formed in solution to be readily removed away by washing, while leaving the "AB3" product on the support. The potential of several of the compounds for PDT has been evaluated in cell culture. for potential PDT applications. Generally, these compounds are readily taken up in cells, have very low dark toxicity, exhibit rapid toxicity in near-infrared light, and are broadly dispersed in the cell including in lysosomes and in the endoplasmic reticulum.