

Abstract Submitted
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Interaction of Human Serum Albumin with Metal Protoporphyrins JIE HU, UTSA, LORENZO BRANCALEON, Physics Dept. UTSA — Fluorescence spectroscopy is widely used in biotechnology, nanotechnology, and molecular biophysics, since it can provide information on a wide range of molecular processes, e.g. the interactions of solvent molecules with fluorophores, conformational changes, and binding interactions etc. In this study, we present the photophysical properties of the interaction of human serum albumin (HSA) with a series of metal compound of Protoporphyrin IX (PPIX), including ZnPPIX, FePPIX, MgPPIX, MnPPIX and SnPPIX respectively, as well as the free base PPIX. Binding constants were retrieved independently using the Benesi-Hildebrand analysis of the porphyrin emission or absorption spectra and the fluorescence quenching (i.e. Stern-Volmer analysis) and reveal that the two methods yield a difference of approximately one order or magnitude between the two. Fluorescence lifetimes was used to probe whether binding of the porphyrin changes the conformation of the protein or if the interaction places the porphyrin at a location that can prompt resonance energy transfer with the lone Tryptophan residue. In recent years it has been discovered that HSA provides a specific binding site for metal-chelated protoporphyrins in sub-domain IA. This has opened a novel field of study over the importance of this site for biomedical applications but it has also created the potential for a series of biotechnological applications of the HSA/protoporphyrin complexes. Our study provides a preliminary investigation of the interaction with metal-chelated protoporphyrins that had not been previously investigated.

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