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Interaction of albumin with perylene-diimides with aromatic substituents[1] MOHAMMED FAROOQI, MARK PENICK, JESSICA BURCH, GEORGE NEGRETE, LORENZO BRANCALEON, University of Texas at San Antonio — Polyaromatic hydrocarbons (PAH) binding to proteins remains one of the fundamental aspects of research in biophysics. Ligand binding can regulate the function of proteins. Binding to small ligands remains a very important aspect in the study of the function of many proteins. Perylene diimide or PDI derivatives have attracted initial interest as industrial dyes and pigments. Recently, much attention has been focused on their strong$\pi - \pi$ stacks resulting from the large PDI aromatic core. These PDI stacks have distinct optical properties, and provide informative models that mimic the light-harvesting system and initial charge separation and charge transfer in the photosynthetic system. The absorption property of PDI derivatives may be largely tuned from visible to near-infrared region by chemical modifications at the bay-positions. We are currently studying a new class of PDI derivatives with substituents made of the side chains of aromatic amino acids (Tyrosine, Tryptophan and Phenylalanine). We have looked at the fluorescence absorption and emission of these PDIs in water and other organic solvents. PDIs show evidence of dimerization and possible aggregation. We also present binding studies of these PDIs with Human Serum Albumin (HSA). The binding was studied using fluorescence emission quenching of the HSA Tryptophan residue. Stern-Volmer equation is used to derive the quenching constants. PDI binding to HSA also has an effect on the fluorescence emission of the PDIs themselves by red shifting the spectra.

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