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Human Serum Albumin as Vehicle for the Solubilization of Perylene Diimides in Aqueous Solutions.

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Highlights

- For the first time a study investigated the interaction between PDIs substituted with amino acid residues, and a globular protein.
- Only two of the four PDIs interact with HSA.
- For the first time FRET mechanism between the lone tryptophan residue of HSA and the PDI ligands was observed.
- The binding and photophysics of the PDI ligands does not appear to irreversibly affect the structure of HSA.

Abstract.

The chemical, physical and photophysical properties of perylene diimides have attracted substantial attention for the potential applications in diverse fields ranging from advanced materials to biomedical applications. Some applications require the diimides to be in aqueous environment where they tend to dissolve poorly. We investigated the use of human serum albumin as a vehicle to increase the aqueous exposure of monomeric perylene diimides. Since studies on the interactions of these compounds with protein is scarce we characterized the binding and the possible effects on the protein. In order to increase the affinity of the dyes to the protein we have used perylene diimides with substituents that replicate the side chains of natural amino acids. The results show that only the dyes containing the side chain of leucine and phenylalanine yield

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