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Abstract

In order to create a laboratory experiment focused on Fluorescence Resonance Energy Transfer for undergraduate biochemistry students at Ball State University, Human Serum Albumin, an abundant and sponge-like blood protein, was studied through the eyes of a spectrofluorometer. HSA binds very readily to many types of ligands, including drugs and fatty acids. When the lone tryptophan molecule within HSA gets excited, it fluoresces. Changing the shape of the HSA molecule by adding a fatty acid, like palmitic acid, changes the type and intensity of the fluorescence given off by the tryptophan. Adding a drug that can participate in Fluorescence Resonance Energy Transfer, like tetracycline, before adding a fatty acid allows one to quantitatively study the change in shape of the HSA molecule by calculating the exact distance between the tryptophan and the tetracycline. Overall, this research project showed promising results for this idea, but time constraints and difficulties in producing consistent data in the later stages of the project detracted from the ability to form a final unifying conclusive product.

Honors College
Ball State University
Muncie, IN 47306