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SYNTHESIS OF DOUBLE-CLICK AZOBENZENES FOR AN EASY FUNCTIONALIZATION OF BIOMOLECULES

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The control of a bioactive compound's activity is of crucial importance in the fields of medicine and biology. Photopharmacology offers the possibility of obtaining this control by using light, an external, non-toxic and orthogonal stimulus which can be quantitatively and qualitatively regulated, as well as spatially and temporally controlled. More concretely, in photopharmacology the bioactive compound is covalently bound to a photoswitch, a chemical entity that suffers a reversible chemical transformation after the absorption of one photon. Consequently, the physical properties of the bioactive compound will be different before and after irradiation resulting in a different ability to interact with its target.^{1,2}

Several photoswitches such as azobenzenes, hemithioindigos, stilbenes, diarylethenes, spiropyrans, thiophenefulgides and, more recently, donor-acceptor Stenhouse adducts are available.^{3,4} Among all of these, azobenzenes, which reversibly isomerize between the *trans* and the *cis* conformation, are probably the most well-studied. Due to their high quantum yields, fast photoisomerization rates and resistance to optical fatigue, they have been used in the study of ion-channels, GABA_A and Glutamate receptors, for example.⁵⁻⁷

In this work, we aim to offer a simple, fast and selective way of functionalizing a biomolecule with an azobenzene, by taking advantage of click chemistry. Several photoswitches containing 2 different click chemistry moieties were synthesized, allowing a selective covalent bond to 1 or 2 different molecules. In addition, the photophysical properties of these molecules were studied. This library allows to choose, from a variety of molecules, at least one which is suitable for the desired application according to the photophysical properties and click moieties.

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