ELABORATION OF ONE-POT STRATEGIES FOR THE SYNTHESIS OF BODIPY DYES

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BODIPY (4,4-difluoro-4-bora-3a,4a-diaza-s-indacene) dyes have been discovered in 1968, however they are still widely utilized [1]. Owing to their favorable optical, chemical and biological properties, these dyes might be used in several fields, including bioimaging, optoelectronics and photodynamic therapy. Halogenated BODIPYs appeared as effective photosensitizers, however they display high dark cytotoxicity, owing to the presence of the heavy halogen atoms. Recently, orthogonal BODIPY dimers have come into the focus of attention [2]. The dimeric derivatives might be considered as unique alternatives to halogenated monomers, by exhibiting low dark toxicity and high phototoxicity, even at low concentrations. Nevertheless, the photosensitization mechanism of the dimers is still unclarified. In order to investigate their mechanism of action, there is a great demand for their better accessibility. The current synthetic strategies afford the dimers in very low yields.

Our aim was to elaborate effective methodologies towards the synthesis of BODIPY derivatives. Considering the principles of green chemistry, we planned to simplify the synthetic routes by minimizing the reaction time and the number of the reaction steps.

We worked out a one-pot procedure leading to BODIPY dyes starting from aryl aldehydes or carboxylic acid derivatives. The acylation of the disubstituted pyrrole was achieved in a microwave-assisted reaction, without using an acid catalyst. Functional groups capable of later conjugation were introduced by choosing the appropriate substituted acylating agent or *via* postfunctionalization. The transition metal-catalyzed dimerization of the monomers led to the desired dimers in good overall yield. We believe that optical and biomedical investigation of our newly synthesized BODIPY derivatives might provide valuable information for the design of photosensitizers with improved selectivity.

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References
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