

## Abstract

This work aims at showing synthesis and potential use of water-soluble fluorescent probes based on BODIPY. The preparation of probes containing bioorthogonal mono- and heterobifunctional functional groups was demonstrated. Ground work was done at the optimisation of reliable, scalable and fast sulfonation of BODIPY in 2,6-positions. A protocol for handling sulfonated BODIPY has been established; especially for the exchange of counterions. In counterion selection, their relation to synthetic pathway and biocompatibility were taken into consideration.

The second part of the work shows series of water-soluble fluorescent probes, into which can be easily introduced bioactive or bioorthogonal functional groups. This can be used for click chemistry in connection with turn off/on probes or fluorescent sensing of molecules or ions. All this can be done in aqueous solution without organic solvents, which is relevant for biochemical, analytical and imaging applications.

**Keywords** BODIPY, bifunctional, water-soluble, fluorescent probe, solubilization, biocompatible probes, bioorthogonal reaction, BODIPY sulfonation