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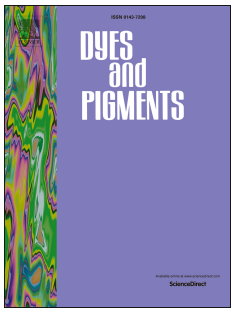

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Facile synthesis of green-light and large Stokes-shift emitting coumarins for bioconjugation

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A B S T R A C T

Bright and hydrosoluble fluorescent dyes with large Stokes shifts are widely used as molecular probes and light-emitting markers in chemistry and biology. In this report, one-step synthesis of a bright green-emitting coumarin (Φ = 0.52, λ_{em} = 505 nm) was achieved from available reagents under neat conditions. The novel dye **1** showed very large Stokes shift ($\Delta\lambda$ = 138 nm) due to strong intramolecular charge transfer (ICT) effect, which was confirmed by density functional theory (DFT) calculations. Dye **1** was hydrosoluble and displayed strong emission at a wide range of pH from 3 to 8. Importantly, the secondary amine in **1** made it extremely convenient for futher bioconjugation. Representative derivatives were showcased for various successful applications of fluorogenic enzyme assay, biolabelling and mitochondrial staining.

Keywords: Coumarin, Green-emitting, Large Stokes shift; Bioconjugation