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Coumarin/Fluorescein-Fused Fluorescent Dyes for Rapidly Monitoring Mitochondrial pH Changes in Living Cells

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Abstract

On base of the good optical properties of coumarin and fluorescein, we designed and synthesized two coumarin/fluorescein-fused fluorescent dyes (**CF** dyes), which enlarged the emission wavelength and increased the Stokes shift of fluorescein moiety. The corresponding optical properties of **CF** dyes were investigated in detail. **CF** dyes could easily introduce other groups to design different functional molecules. **CF** dyes also exhibited rapid and sensitive responses to pH values in the range of 4.0–7.4 through the characterization of absorption and fluorescence spectra in buffer solution. More importantly, **CF** ethyl ester dye (**CFE** dye) not only showed good cell membrane permeability and low cytotoxicity, but also had the ability to rapidly monitor mitochondrial pH changes in living cells.

Keywords: Fluorescent dye; Fluorescein; Coumarin; pH probe; Cell imaging

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