

BrightSwitch®: A New Family of Dual Emissive Photoconvertible Fluorescent Probes for Bioimaging

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Photoconversion is a powerful tool in bioimaging for tracking organelles and biomolecules in cells and can advantageously be used in SMLM. Although photoconvertible proteins dominate the field, small molecular photoconvertible probes that present advantages over proteins remain rare.^[1-2] Herein we present BrightSwitch®: a new family of dual emissive photoconvertible fluorescent probes. The BrightSwitch® probes are based on bright fluorophores like coumarins and BODIPYs conjugated to an ASORM (Aromatic singlet oxygen reactive moiety). Upon excitation, the fluorophore generates singlet oxygen, which selectively oxidizes the ASORM and leads to an hypsochromic shifts in absorbance and emission spectra. This mechanism that we established is called Directed Photooxydation Induced Conversion (DPIC). In addition, these probes display blinking properties without any specific buffer and thus can be used as probes for SMLM in live cells. These probes were designed to fit with typical microscope channels and are adapted to excitation sources like 405, 488, 560 and 640 nm. Owing to their functionalization site, the BrightSwitch® can be targeted to various organelles (plasma membrane, mitochondria, actin, etc.) and can be tagged to proteins (SNAP, Halo, etc) offering a versatile tool for organelles and biomolecules tracking and imaging in advanced microscopy.

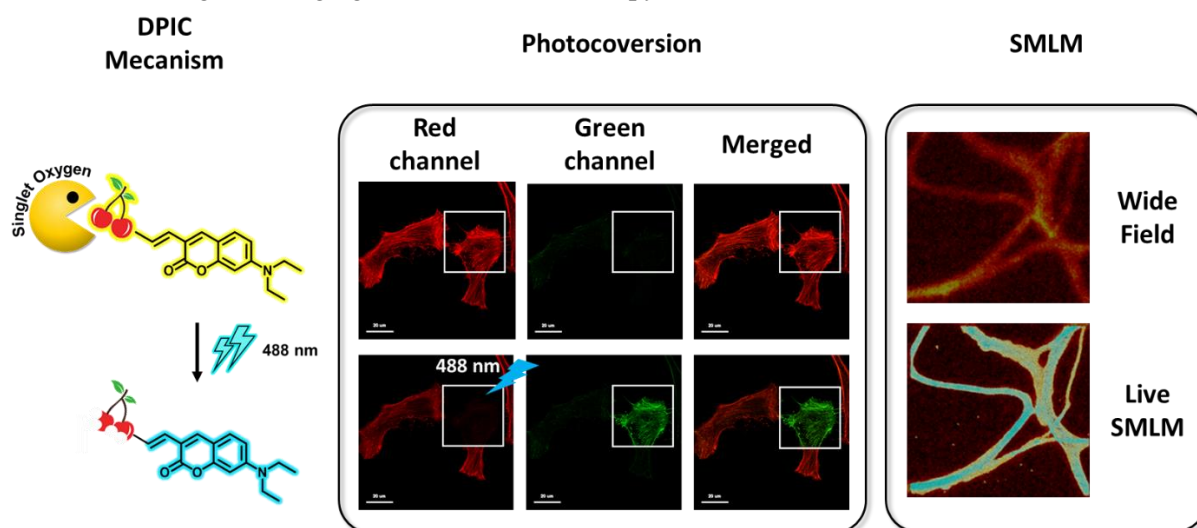


Figure. Properties of BrightSwitch® dyes and their applications in fluorescence imaging

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References: [1] Jun, et al. *J. Am. Chem. Soc.* **2019**, *141* (5), 1893–1897. [2] Cho et al. *J. Am. Chem. Soc.* **2021**.