

Directed Photooxidation: A Versatile Strategy for Photomodulable Molecular Probes in Live Super-Resolution Imaging

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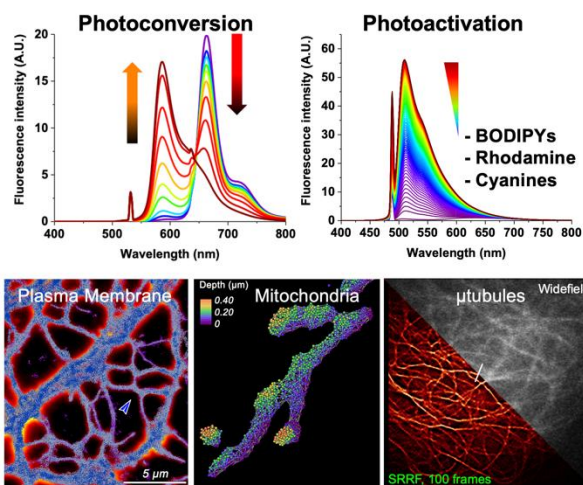
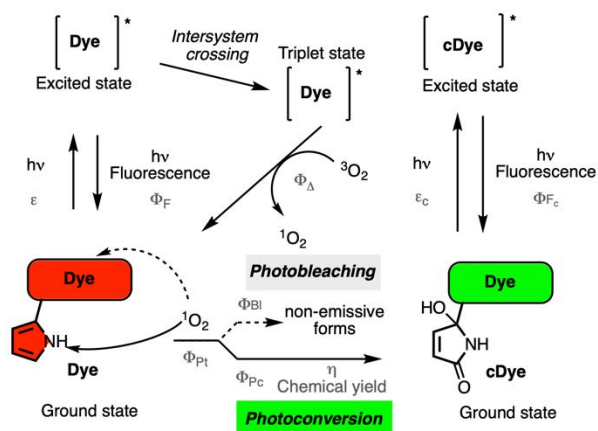
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Abstract: Super-resolution imaging mostly relies on fluorescent probes with photomodulation properties, such as photoactivation or photoswitching. While fluorescent proteins have long dominated this field, they suffer from limited versatility and optimization challenges. In contrast, small-molecule probes offer ease of use, modularity, and selective targeting, including the ability to label proteins of interest via HaloTag technology.

Our team recently introduced a novel concept called *directed photooxidation*,¹ which leverages singlet oxygen emitted by fluorescent probes, even with low quantity (low ϕ_{Δ}), to render them photomodulable and compatible with single-molecule localization microscopy (SMLM). Using this approach, we developed a series of photoconvertible, photoactivatable, and photoswitchable probes targetable to various organelles or proteins. We demonstrated their application in 3D SMLM and dynamic SMLM imaging of live samples, highlighting their potential for super resolution bioimaging.^{2, 3, 4}

Directed Photooxidation Induced Conversion (DPIC)



References:

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