



Literature Report V

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Communication

Water-Soluble BODIPY Photocages with Tunable Cellular Localization

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Reporter: Wenchao Jiang

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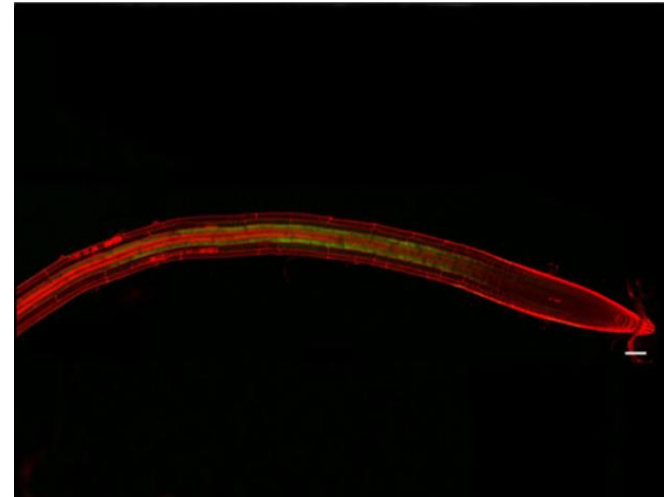
CV of Dr. Roy Weinstein



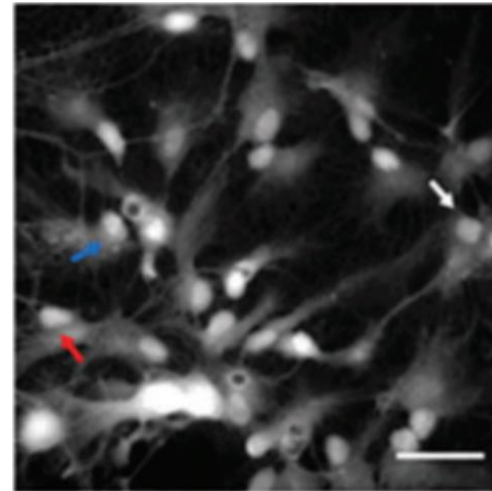
Dr. Roy Weinstein

Tel-Aviv University, Israel

- Exploring plant hormones dynamic (distribution patterns, flow pathways)
- Developing optochemical techniques (plant sciences, drug delivery and neuroscience.)



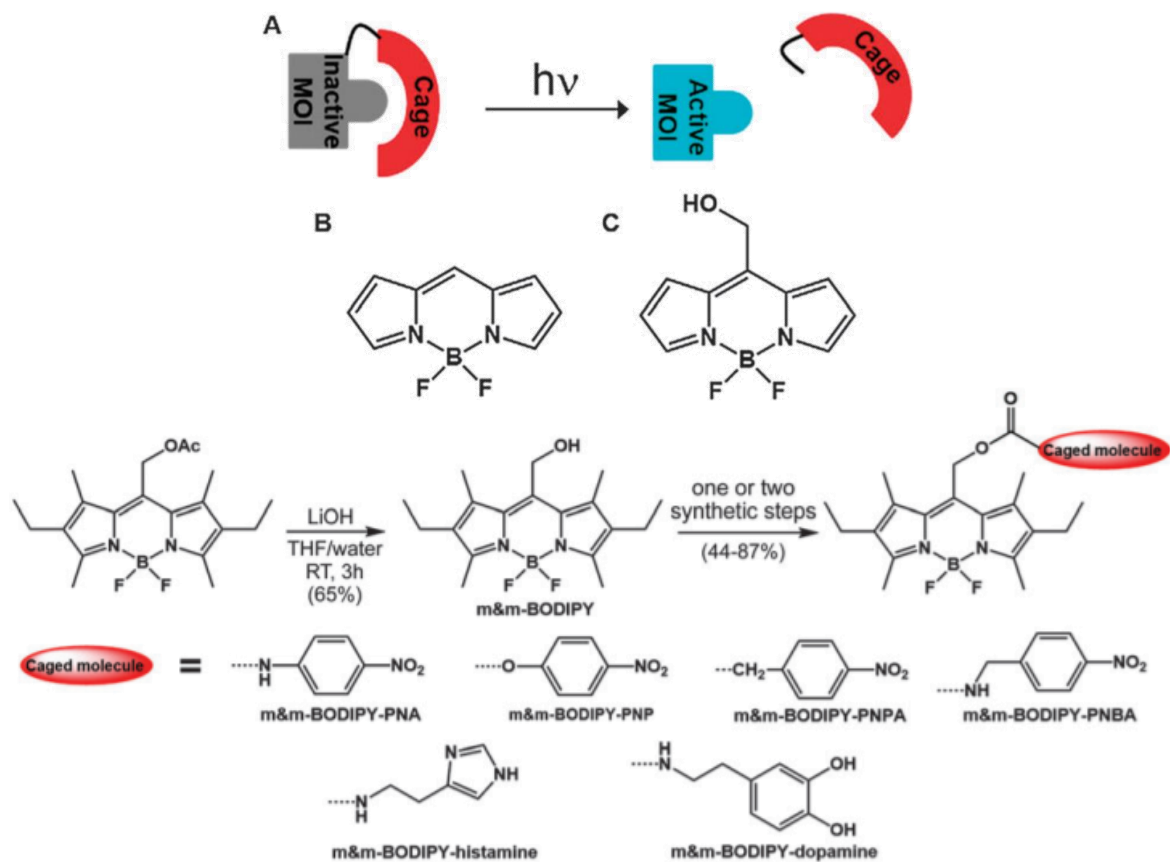
The specific accumulation pattern of gibberellin in Arabidopsis *Thaliana* root as unveiled by fluorescently labeled GA.



Imaging $[Ca^{2+}]_i$ dynamics in cultured neurons following green light mediated photoactivation of dopamine

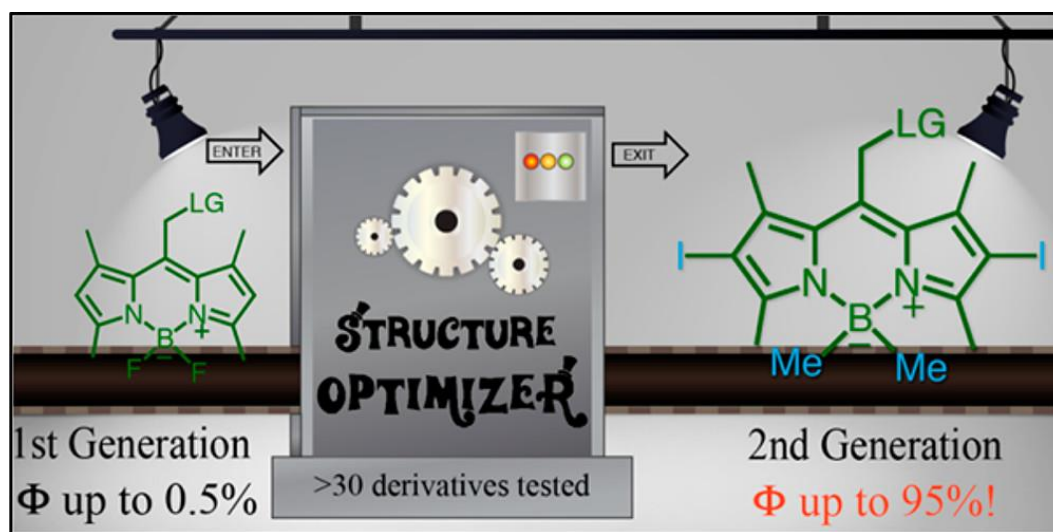
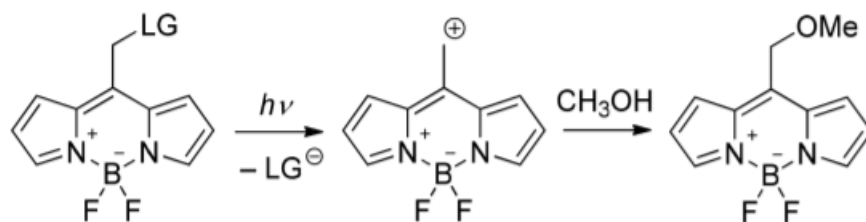
Introduction

meso-Methylhydroxy BODIPY



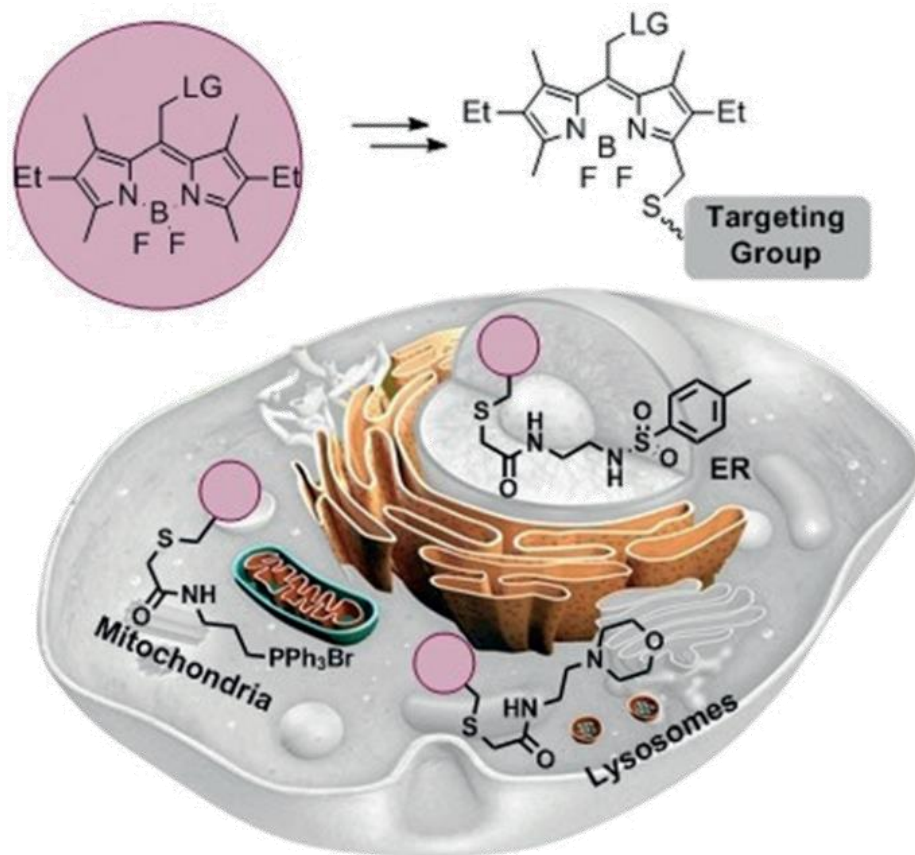
Introduction

Structure-Reactivity Relationships in meso-Methyl BODIPY

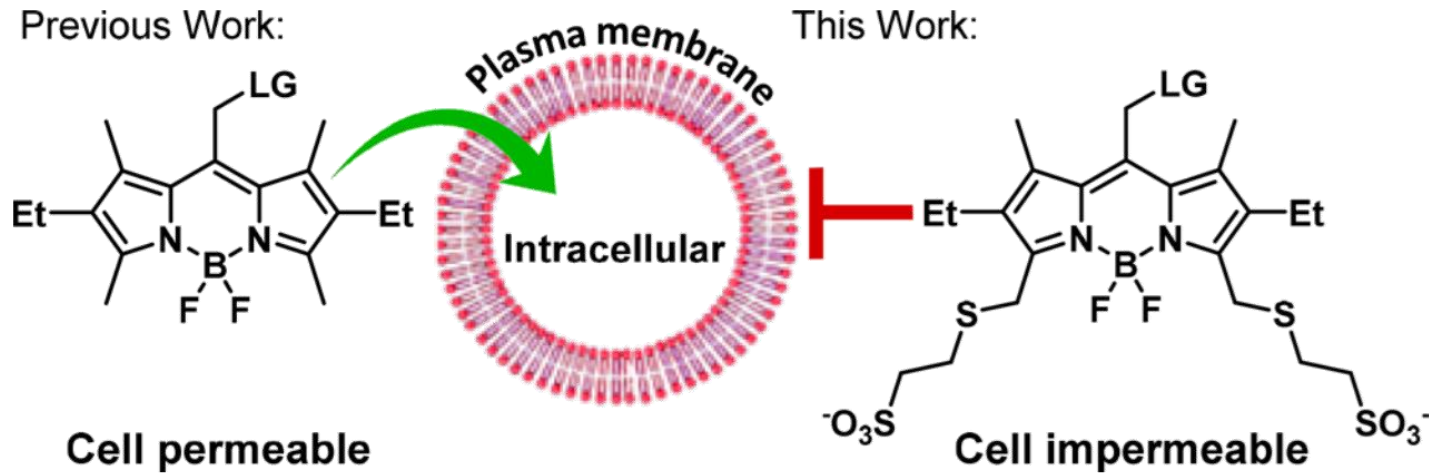


Introduction

Organelle-Targeted BODIPY Photocages



The Design of Water-Soluble BODIPY Photocages

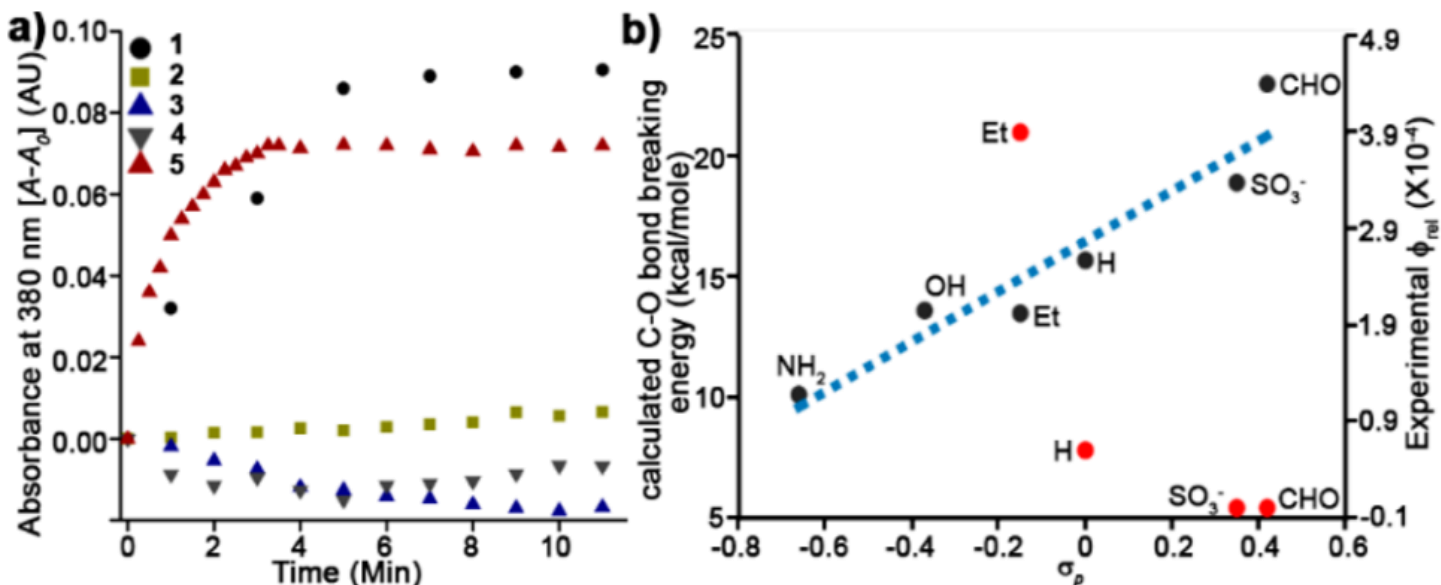
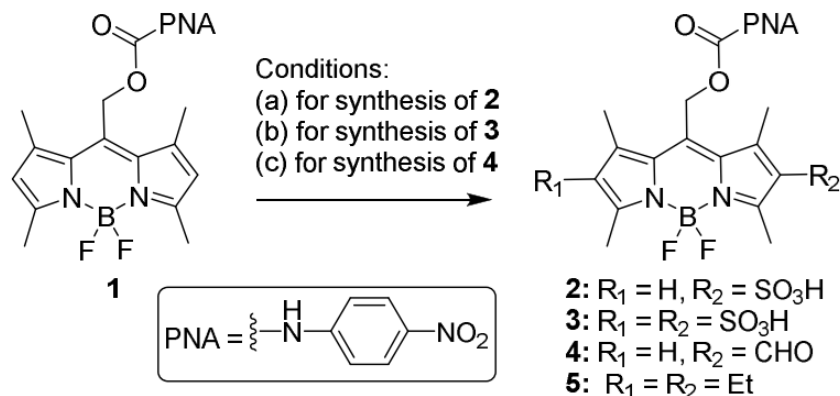


intracellular interventions

targeting extracellular proteins
plasma membrane residing receptors
molecule existing both intra- and extracellularly

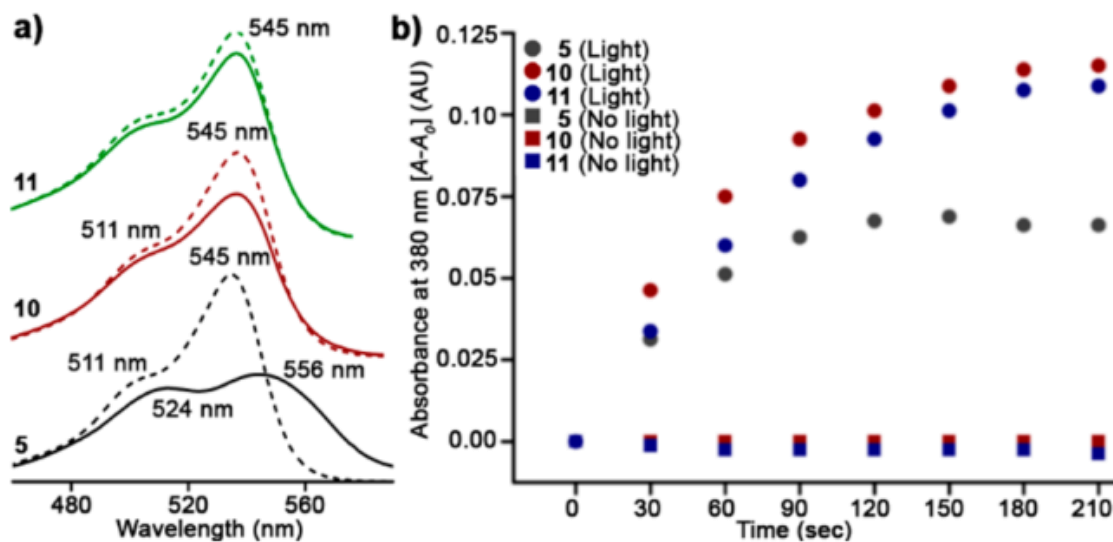
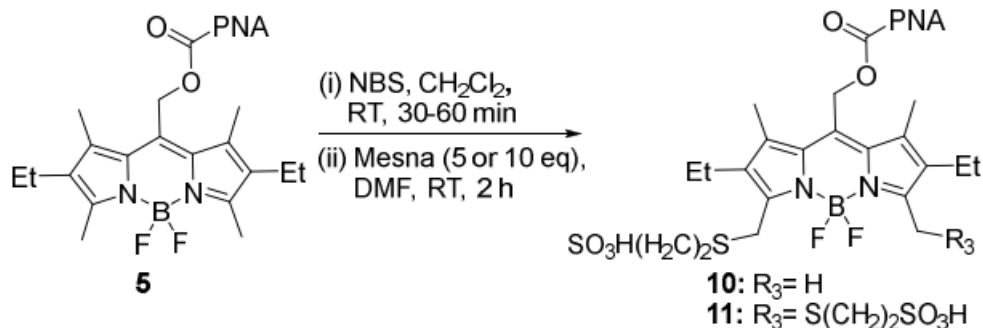
Synthesis and characterization of BODIPY PPGs

Conventional 2,6-sulfonation meso-methyl BODIPY



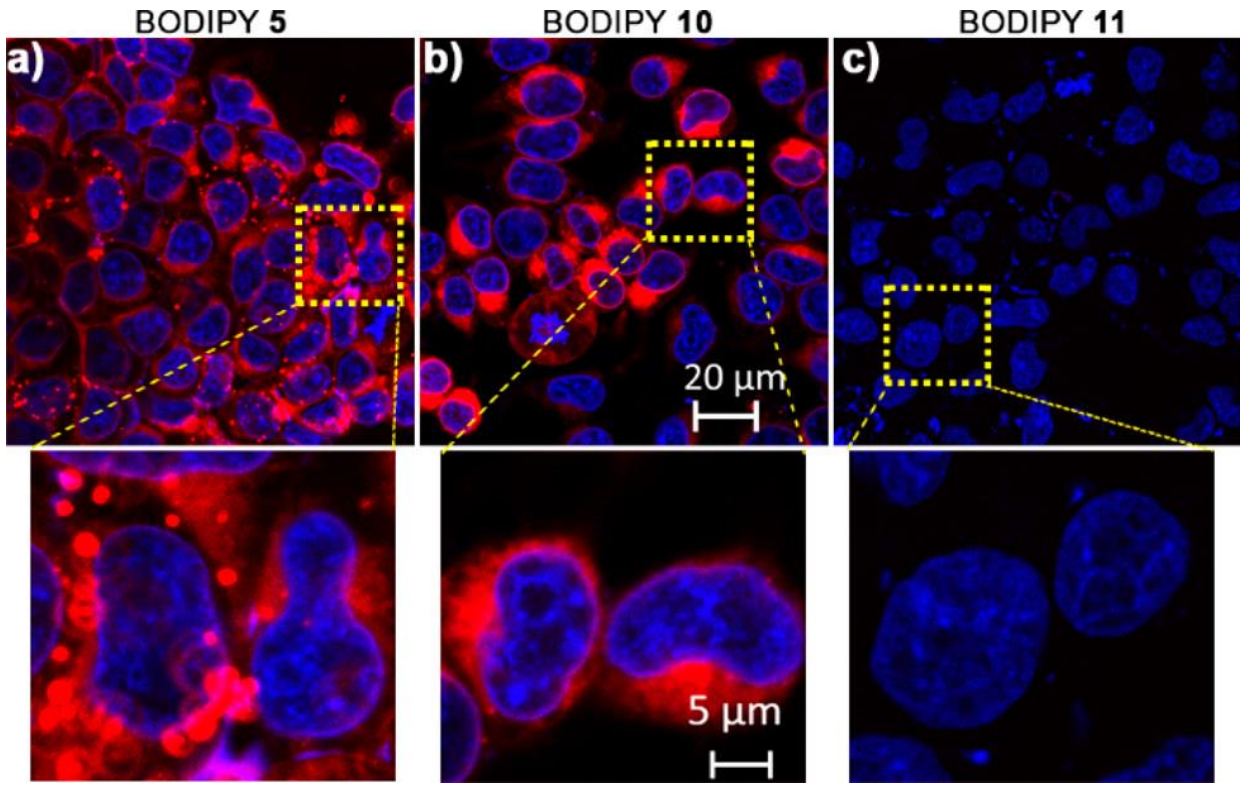
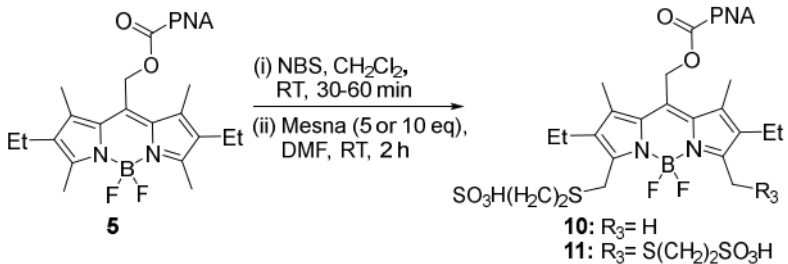
Synthesis and characterization of BODIPY PPGs

Remote sulfonation meso-methyl BODIPY



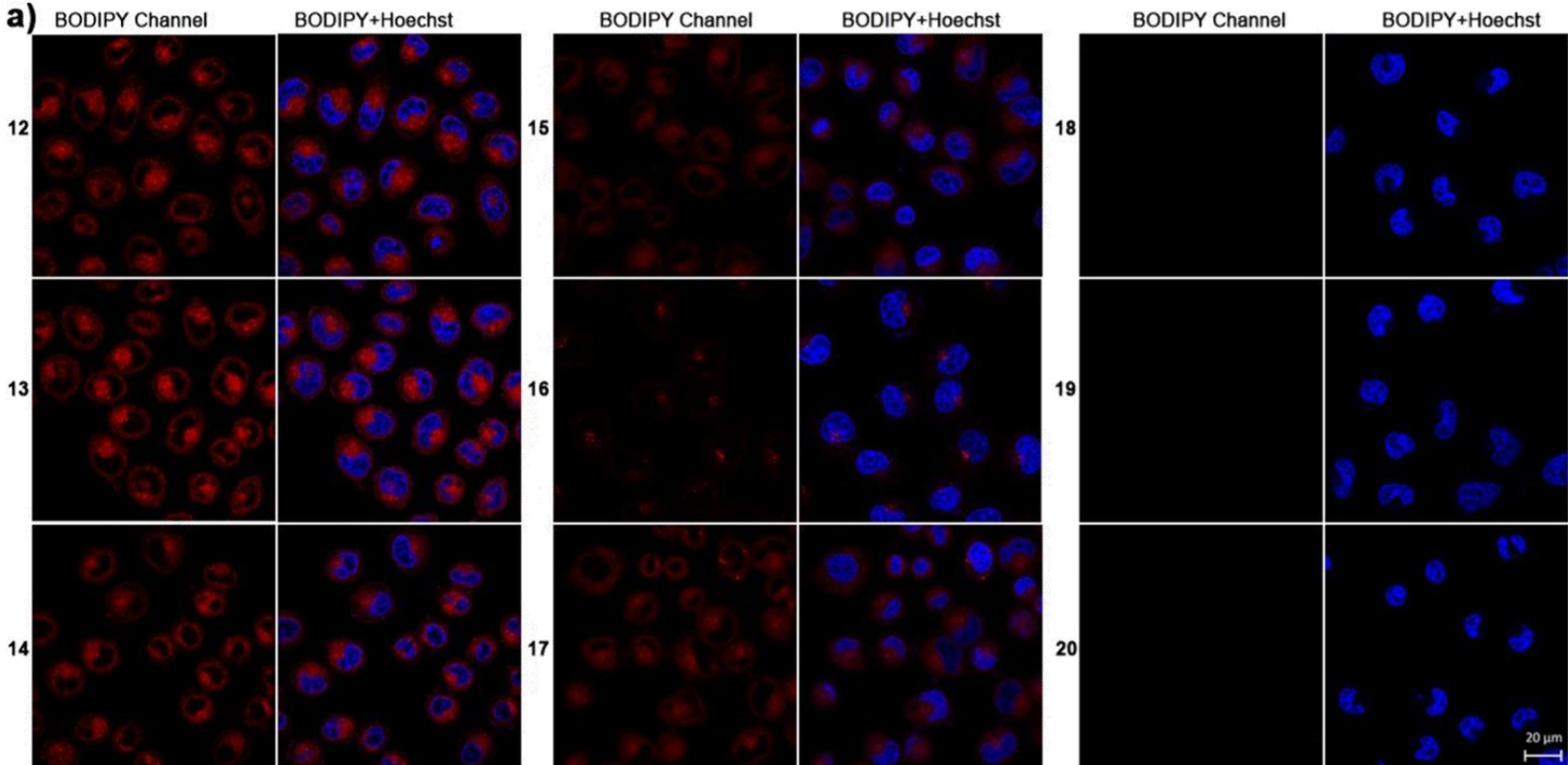
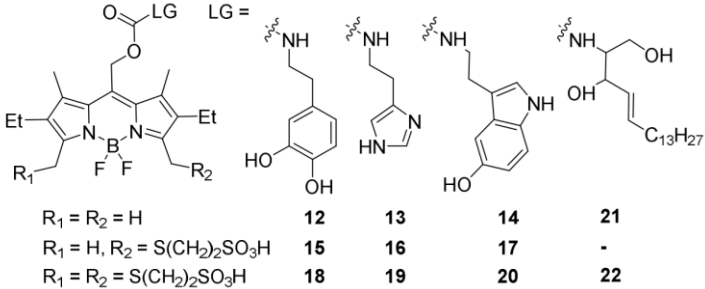
BODIPY PPGs with Tunable Cellular Localization

The degree of sulfonation influences the cellular uptake



BODIPY PPGs with Tunable Cellular Localization

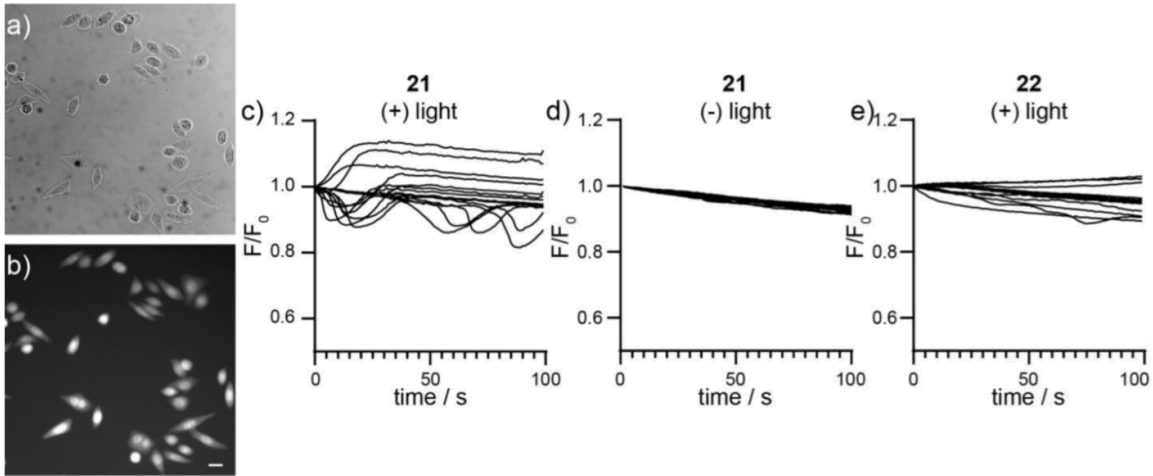
Effect of leaving group on cell membrane permeability



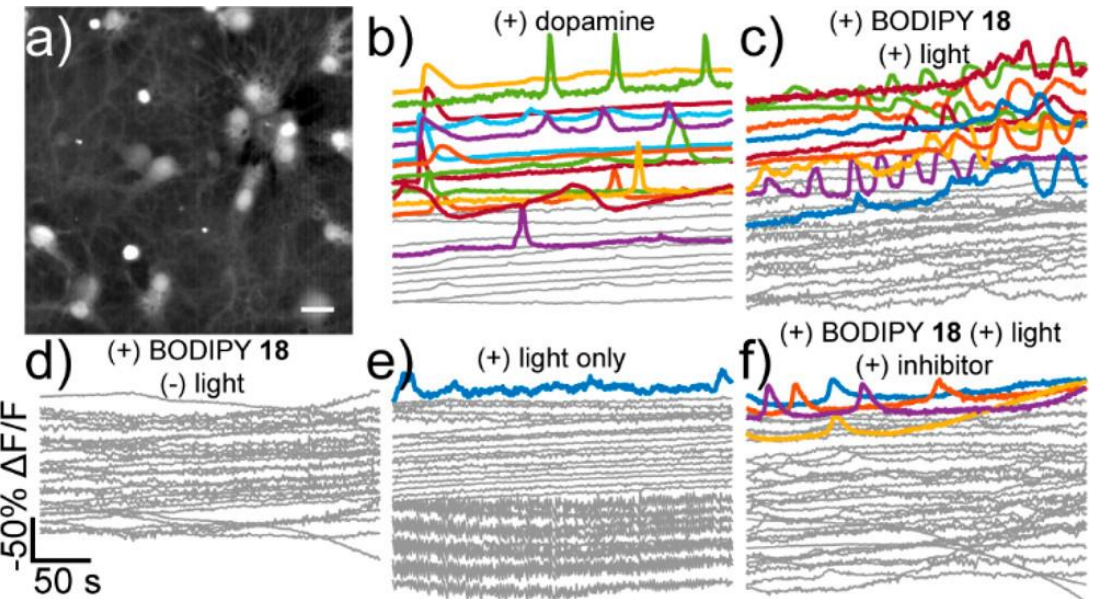
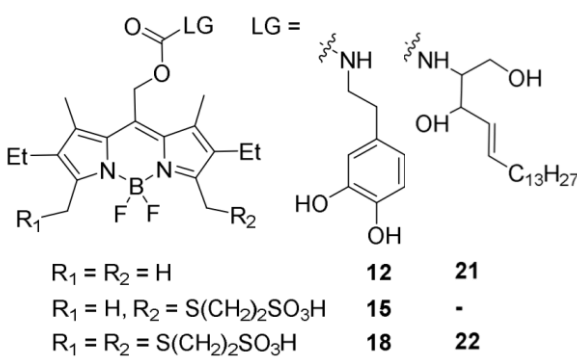
BODIPY PPGs with Tunable Cellular Localization

BODIPY localization validated by mammalian cells and neurons

HeLa cells



21 with Ca^{2+} indicator, fura-2



Summary

- A simple, remote sulfonation solution to BODIPY photocages
- Water solubility, ability to control cellular permeability, retaining their favorable spectroscopic and photoreaction properties
- BODIPY localization validated by mammalian cells and neurons

Thanks for your attention!