



OPTICAL CONTROL OF NATIVE STORE-OPERATED CALCIUM ENTRY CHANNELS

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Store operated calcium entry through calcium release activated calcium (CRAC) channels replenishes intracellular calcium stores and plays a critical role in cellular calcium signaling. CRAC channels are activated by tightly regulated interaction between the endoplasmic reticulum calcium sensor STIM proteins and plasma membrane Orai channels. Our current understanding for the role of STIM-Orai dependent calcium signals under physiologically relevant conditions remains limited in part due to a lack of spatiotemporally precise methods for direct manipulation of endogenous CRAC channels. I will present recent findings from our work on the synthesis and characterization of azoboronate Light Operated CRAC channel Inhibitors (LOCIs) that allow for a dynamic and fully reversible remote control of the function of native CRAC channels using ultraviolet and visible light. We further demonstrate the use of LOCI to modulate gene expression in T-lymphocytes and cancer cell seeding at metastatic sites.