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THE NEW TRUE RED-EMITTING CALCIUM INDICATOR FOR CARDIOMYOCYTES

ICR-I

ION Calcium Red*

Excitation: 580 nm
Emission: 660 nm
Kd Ca^{2+}: 480 nM

- pH insensitive in the physiological range
- No localization to mitochondria
- Ideal for optogenetics & photopharmacology

Live-cell fluorescence microscopy

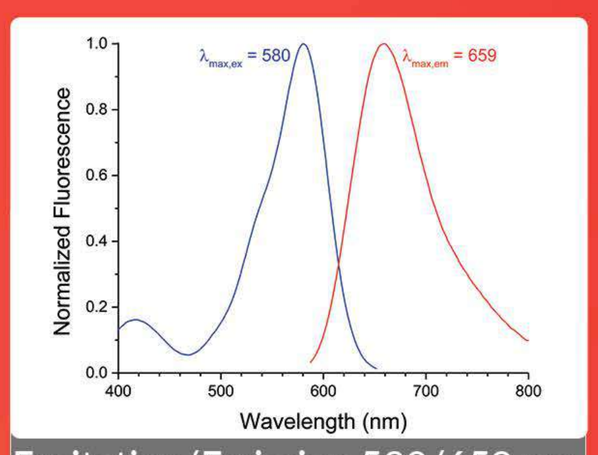
Deeper tissue penetration

Minimize autofluorescence

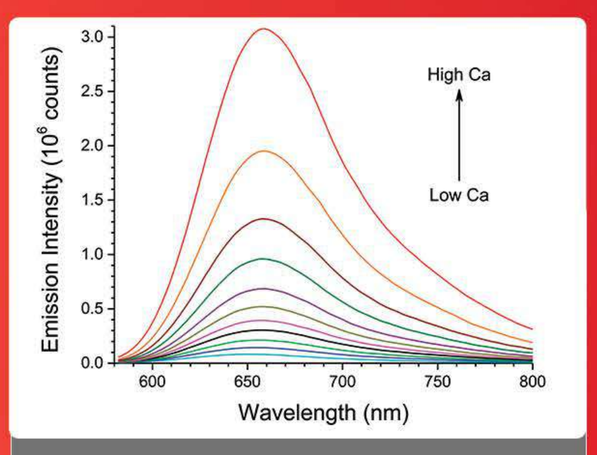
High-throughput screening:

Eliminate fluorescent compound artifacts

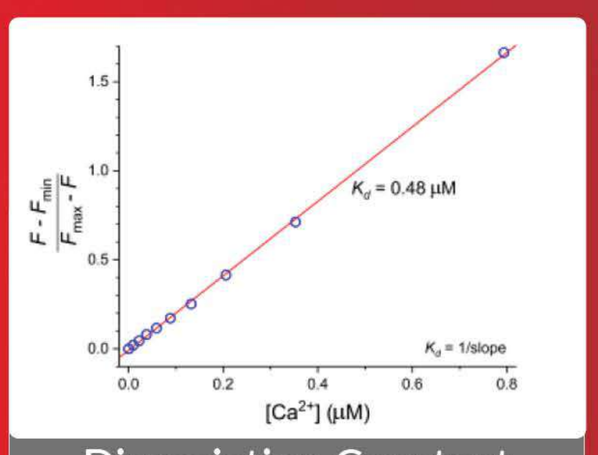
Enable multiplexed readouts



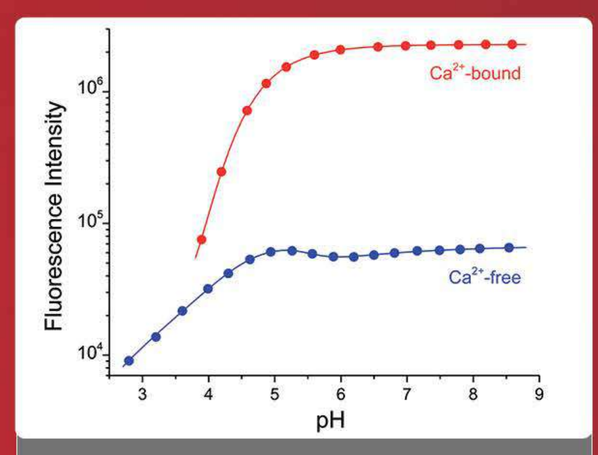
Excitation/Emission 580/659 nm
Stoke's Shift 80 nm



Calcium Titration



Dissociation Constant
Kd=0.48 µM

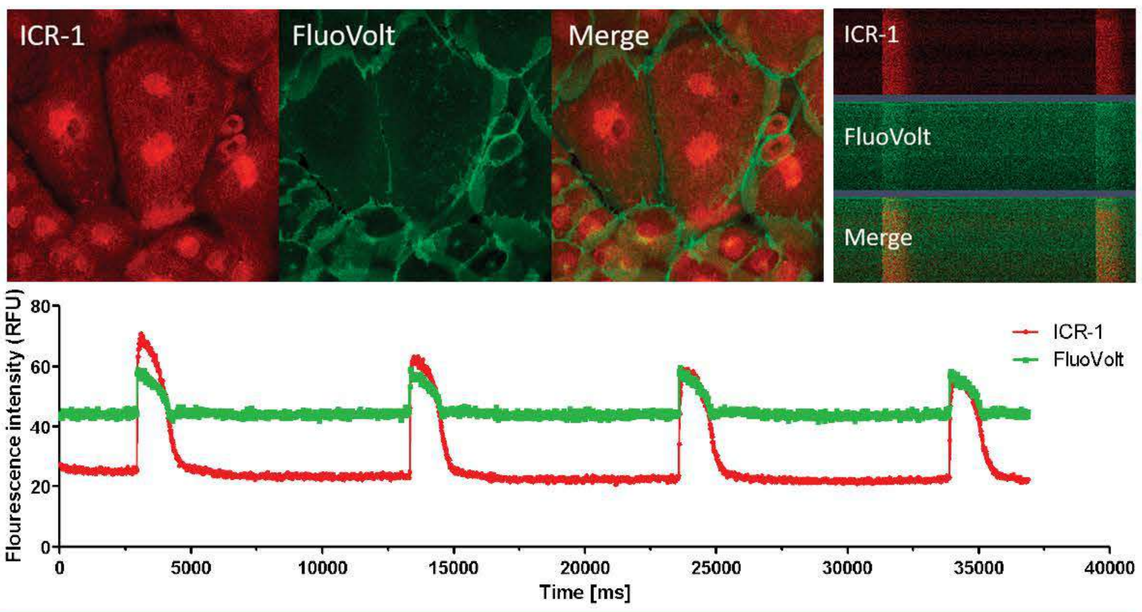


pKa = 5

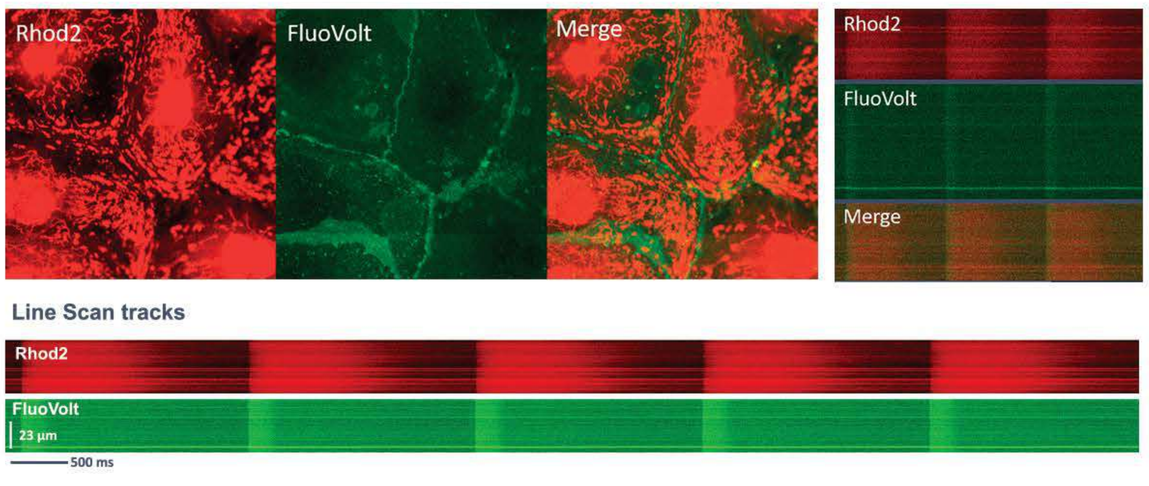
Figures and descriptions are courtesy of Professor Joe Kao of University of Maryland Medical School.

STEM CELL DERIVED CARDIOMYOCYTES

Fluo-Volt & ICR-1



FluoVolt & Rhod-2



Rhod-2 is problematic due to mitochondrial accumulation, also in combination with FluoVolt.

Simultaneous detection of Ca^{2+}–transients and action potentials in iPSC-CM using ICR-1 and FluoVolt

Protocol:

- iPSC-CMs differentiated using CHIR and IWP2 standard protocols (Cyganek et al. 2018) and maturation for ~100 days in RPMI/B27 medium (to achieve a more adult-like phenotype)
- Cells were seeded as monolayers on 22 mm glass coverslips (coated with Geltrex)
- Cultured for 7 days in standard RPMI B27 medium

Assay:

- Dissolve ICR-1 in 7 µl DMSO (similar as done for Fluo-4, to achieve a concentration of 5 mM using 50 µg packages)
- Mix 16 µl Powerload (FluoVolt Kit ThermoFisher) with 2 µl ICR-1 and 2 µl FluoVolt
- Add 2 ml Tyrodes Buffer → staining solution
- Incubate coverslip in 6-well plate with 2 ml staining solution for 30-40 minutes at 37°C
- Transfer coverslip in pacing chamber with Tyrode buffer
- Measure using LSM 880 line scanning mode

*Protocol and results shown are courtesy of Dr. Mario Schubert, Technical University of Dresden.

*Patent pending