Data Sheet

BioTracker™ ATP-Red Live Cell Dye

Live Cell Probe

SCT045

Pack Size: 1 mg

Store at −20 °C

FOR RESEARCH USE ONLY

Not for use in diagnostic procedures. Not for human or animal consumption.

Background

Adenosine triphosphate (ATP) is the primary energy source for all cellular processes. ATP also functions as a signaling molecule for regulating cell movement, neurotransmission, and ion channel functions. ATP is localized in mitochondria, where cellular respiration occurs. ATP levels can be used to measure cell proliferation and cell cycle dynamics.

The BioTracker™ ATP-Red dye is a live cell red fluorescent imaging probe for adenosine triphosphate (ATP). The probe targets ATP specifically in the mitochondria of living cells. The probe shows no cross reactivity to numerous analytes including: Zn^{2+}, Mg^{2+}, Ca^{2+}, Na^{2+}, K^{+}, GSH, HOCL, H_2O_2, arabinose, galactose, glucose, fructose, ribose, sorbose, sucrose, xylose, heparin, AMP, ADP, CMP, CDP, CTP, UMP, UDP, UTP, GMP, GDP or GTP.

Spectral Properties

Excitation max: 565 nm

Emission max: 592 nm

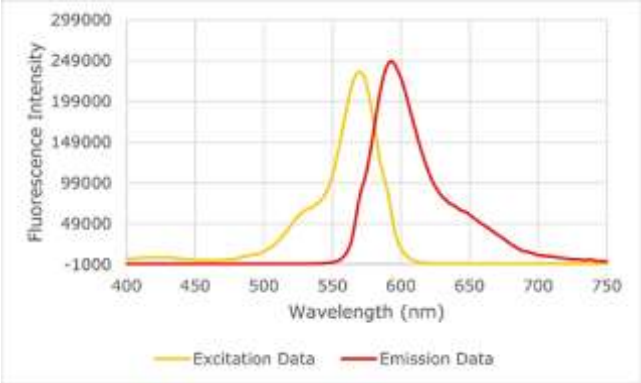

Figure 1: Probe excitation and emission data. 7 µL of probe at stock concentration (10 mM) was diluted in 1 mL of DMSO before undergoing excitation and emission scans. Spectral scans were conducted using a PerkinElmer FL8500 Fluorescence Spectrophotometer.

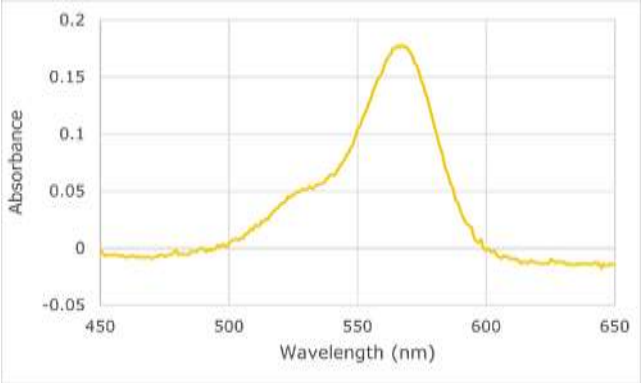

Figure 2: Probe absorbance data. 7 µL of probe at stock concentration (10 mM) was diluted in 1 mL of DMSO before undergoing an absorbance scan. Spectral scans were conducted using a PerkinElmer FL8500 Fluorescence Spectrophotometer

Quality Control Testing

Purity: ≥ 98% confirmed by HNMR, LC-MS and HPLC and elemental analysis.

Molar Mass: 561.48 g/mol.

Storage and Handling

Store BioTracker™ ATP-Red Live Cell Dye at −20 °C, desiccate and protect from light.

Note: Centrifuge vial briefly to collect contents at bottom of vial before opening.

Presentation

Lyophilized

Representative Data

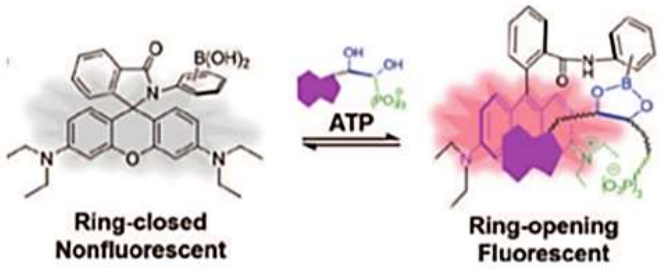

Figure 3. ATP-Red Mechanism. The probe is non-fluorescent when forming a closed ring structure. In the presence of the negatively charged ATP, the covalent bonds between boron and ribose are broken and the ring opens, producing fluorescence

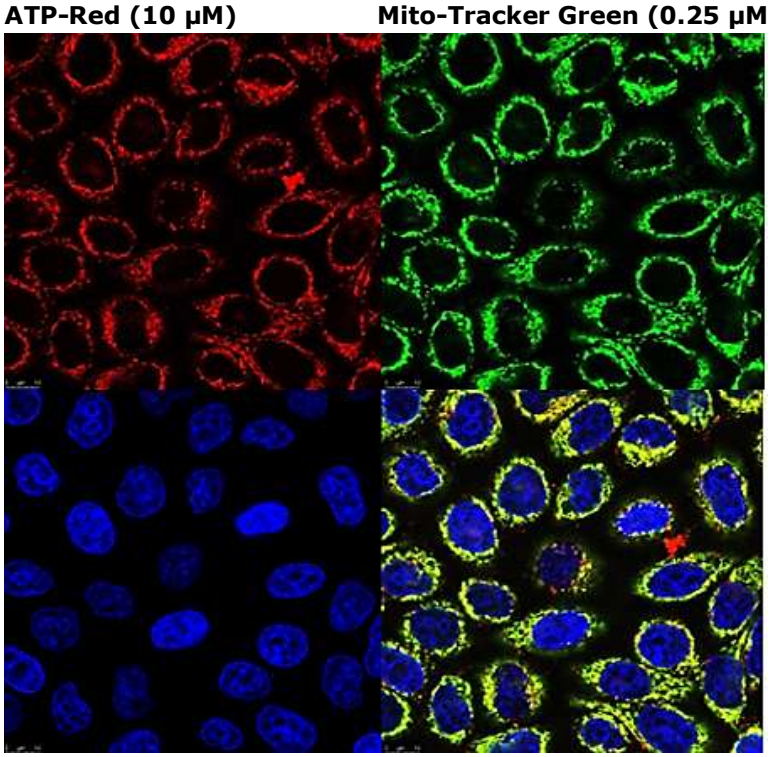

Figure 4. Intracellular localization of ATP-Red in HeLa cells compared to Mito-Tracker green. Cells were incubated with ATP-Red and Mito-Tracker Green for 15 minutes each.

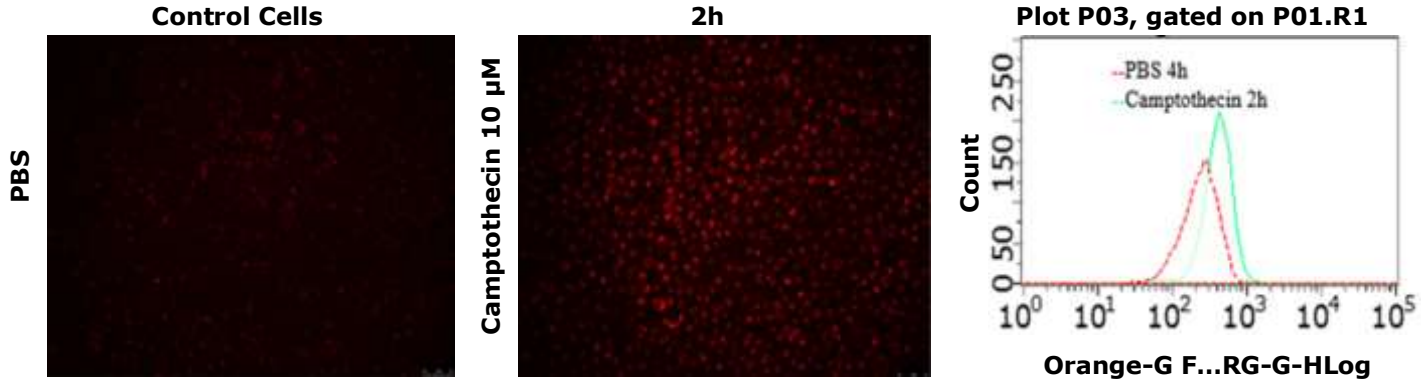

Figure 5. Camptothecin (10 µM) increases intracellular ATP level analyzed in living Jurkat cells with ATP-Red using microscopy and flow cytometry.

Protocols

Reagent Preparation

1. Before opening the vial, spin down the solid to the bottom by a microcentrifuge or by a desktop centrifuge.
2. Warm the vial to room temperature and add 178 µL DMSO to the lyophilized probe (MW-561.48) to make a 1000X stock solution of 10 mM. Freeze aliquots at -20 °C.
3. Dilute stock solution in cell culture media to a final concentration of 5-10 µM and add to cells in culture. Incubate at 37 °C for 15 minutes.
4. Wash cells with PBS buffer before imaging.

   Note: Optimal concentration must be determined by end user.

References

1. Chang YT et al. A Multisite-Binding Switchable Fluorescent Probe for Monitoring Mitochondrial ATP Level Fluctuation in Live Cells. Angew Chem Int Ed Engl. 2016 Jan 26;55(5):1773-6.

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