Data Sheet

BioTracker™ NIM-7 Lipids and Lysosomes Live Cell Dye

Live Cell Probe

SCT070

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

Lipid droplets (LDs) and lysosomes are specialized subunits within cells. LDs are the most hydrophobic sub-structures within cells and serve to store lipids for energy generation and membrane synthesis. Lysosomes are typically acidic organelles (pH 4.5–5.0) that play a critical role in the digestion and clearance of endocytosed and endogenous intracellular materials. BioTracker™ NIM-7 Lipids and Lysosomes Live Cell Dye is a naphthalimide-based fluorescent probe that allows lipid droplets and lysosomes to be labelled simultaneously and visualized separately using different excitation and detection channels. Lipid droplets and lysosomes can be visualized in the yellow and red fluorescence regions, respectively. The probe was found to have low cytotoxicity in multiple cell lines after 24-hour incubation. SCT070 also demonstrates high photostability and can maintain 90% of original fluorescence intensity after 15 min of irradiation.

Source

The BioTracker™ NIM-7 Lipids and Lysosomes Live Cell Dye (SCT070) does not contain genetically modified organisms.

Spectral Properties

Emission: 600 nm (Lipid Droplet Targeting), 760 nm (Lysosome Targeting)

Note: For lipid droplet targeting it is recommended to use a 488 laser with an emission window of 570-620 nm; For lysosomal targeting it is recommended to use a 561 laser with an emission window of 730-780 nm. These settings enhance the ability to distinguish between lipid droplets and lysosomes.

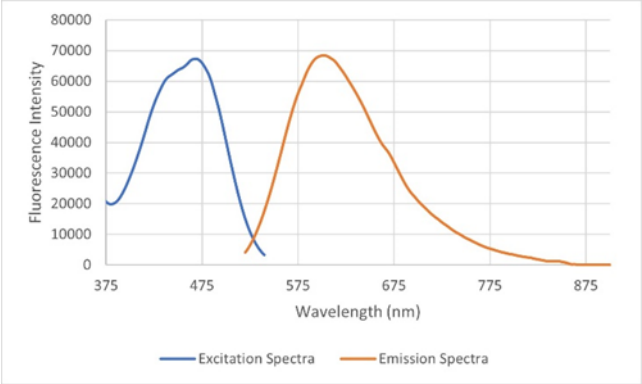

Figure 1: Probe spectral data under hydrophobic conditions representing lipid droplet targeting. 5 µL of probe at stock concentration (10 mM) was diluted in 1 mL of Toluene before undergoing excitation and emission scans. Spectral scans were conducted using a PerkinElmer FL8500 Fluorescence Spectrophotometer.

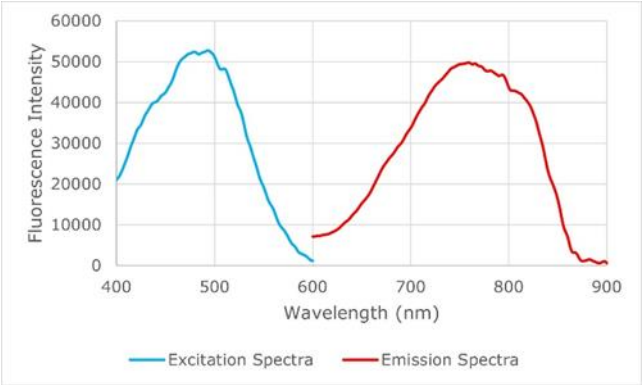

Figure 2: Probe spectral data under hydrophilic conditions representing lysosome targeting. 5 µL of probe at stock concentration (10 mM) was diluted in 1 mL of DMSO before undergoing excitation and emission scans. Spectral scans were conducted using a PerkinElmer FL8500 Fluorescence Spectrophotometer.

Quality Control Testing

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

Molar Mass: 610.57 g/mol

Storage and Handling

Store BioTracker™ NIM-7 Lipids and Lysosomes Live Cell Probe at –20 °C, desiccated and protected from light.

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

Presentation

Lyophilized

Representative Data

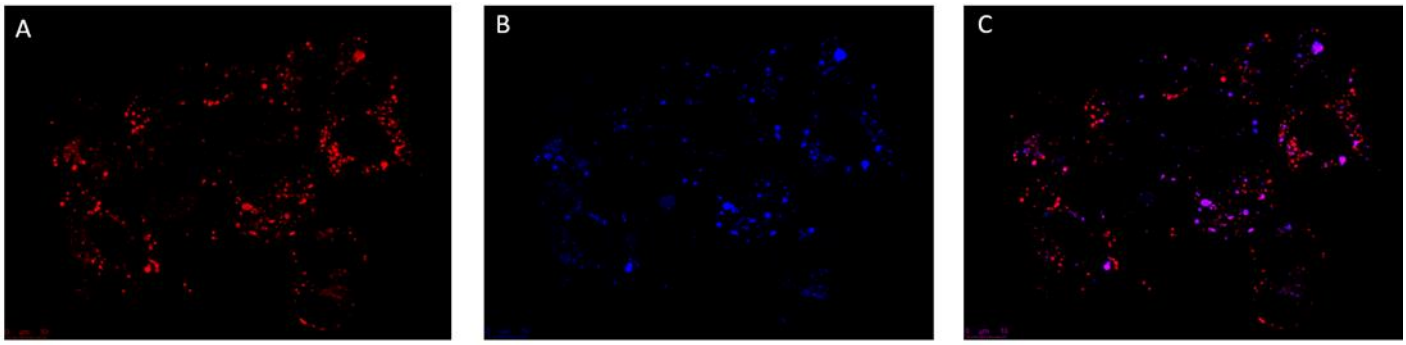

Figure 3: Confocal microscopy images of 0.5 µM BioTracker™ NIM-7 staining in HEPG2 cells. Cells were stained with 0.5 µM NIM-7 for 1 hour. (**A**) Lipid droplet fluorescence targeting shown in red. (**B**) Lysosomal fluorescence targeting shown in blue. (**C**) Merged image showing lipid droplet and lysosomal fluorescence with some colocalization.

Protocols

Preparing BioTracker™ NIM-7 live cell probe stock solution

1. Before opening the vial, spin down the solution to bottom by a microcentrifuge or by a desktop centrifuge.
2. Warm the vial to room temperature. Prepare the NIM-7 (Molecular Weight: 610.57 g/mol) dye stock solution by dissolving the contents of one vial (1 mg) in 165 µL of DMSO to create a 10 mM stock solution (1:10,000).
3. Aliquot and store stock solution at –20 °C or below for longer storage.

Labeling cells

1. Culture cells in an appropriate medium and vessel for fluorescence microscopy.
2. Prepare the NIM-7 staining solution by diluting the NIM-7 stock solution 1:10,000 to 1:1,000 in culture medium.
3. Remove the cell culture medium from the cells.
4. Add sufficient NIM-7 staining solution to cover the cells.
5. Incubate for 1 hour, protected from light.
6. Remove staining solution and wash with PBS. Observe the cells under fluorescence microscope
   - For lipid droplet (LD) targeting: λ_{ex}=488 nm, λ_{em}=570-620 nm
   - For lysosome targeting: λ_{ex}=561 nm, λ_{em}=730-780 nm

References

1. Zheng X, Zhu W, Ni F, Ai H, Gong S, Zhou X, L. Sessler J, Yang C. 2019. Simultaneous dual-color tracking lipid droplets and lysosomes dynamics using a fluorescent probe. Chemical Science. 10(8):2342–2348. doi:https://doi.org/10.1039/C8SC04462G. [accessed 2024 Jan 31]. https://pubs.rsc.org/en/content/articlehtml/2019/sc/c8sc04462g.

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