Data Sheet

BioTracker™ Polyamine Spermine Live Cell Probe

Live Cell Dye

SCT250

Pack Size: 500 µg

Store at –20 °C

FOR RESEARCH USE ONLY

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

Background

Polyamines play a variety of critical roles in cellular processes. Some of these include gene expression, cell proliferation and differentiation, and cellular stress responses. Polyamine dysregulation has been shown to be involved in various cancers. In colorectal cancer, for example, polyamine content and biosynthesis is significantly higher when compared to normal colorectal tissue. A relationship between polyamines and their metabolites has been used to observe progression in breast, lung, colorectal, ovarian, prostate, and pancreatic cancers. In normal cells, there is close regulation of polyamines via usual cellular mechanisms. One of these is known as the polyamine transport system (PTS), the characteristics of which are not fully understood. Studies of the PTS have shown that cancer cells have high PTS activity, suggesting this system as a candidate for cancer research.

The relationship between polyamine systems and cancer led to the creation of clickable polyamine derivatives which can functionally be used to study the PTS. The BioTracker™ spermine live cell dye is a spermine moiety attached to a BODIPY fluorophore through click chemistry. The BioTracker™ spermine live cell dye permits evaluation of polyamine.

Source

SCT250 does not contain genetically modified organisms.

Spectral Properties

Absorption: 494 nm

Emission: 500-510 nm

Quality Control Testing

Purity: ≥ 80% confirmed by HNMR, LC-MS and HPLC and elemental analysis

Molar Mass: 743.35 g/mol

Storage and Handling

Store BioTracker™ Spermine 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. Red-brown solid.

Representative Data

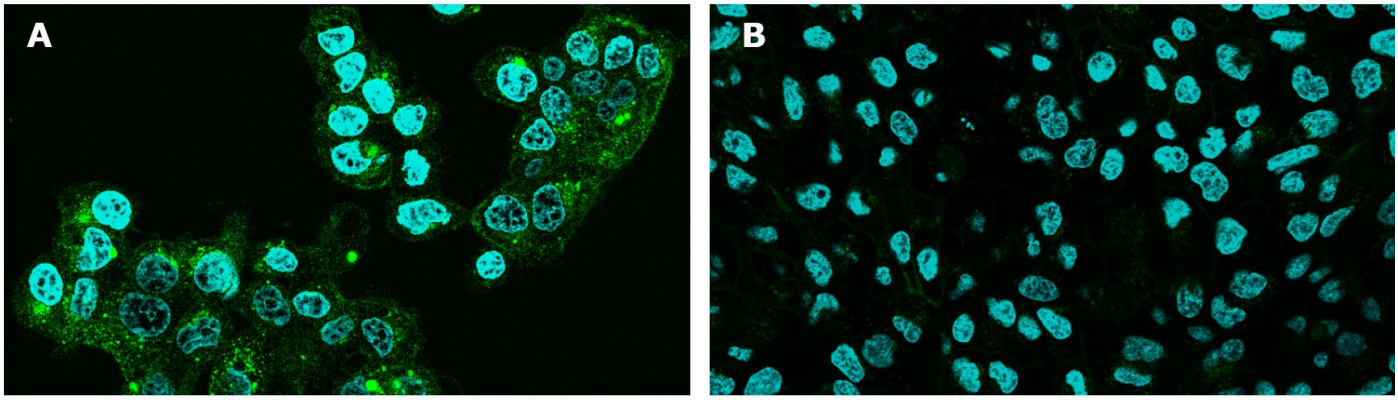

Figure 1: (**A**) Confocal imaging of SCT250 spermine probe (green) in MCF7 cells and (**B**) MCF10A cells. Cells were treated with 10 µM spermine probe for 3 hours at 37 °C and counterstained with Hoechst 33342 nuclear dye (cyan) for 10 minutes. The highly metastatic MCF7 breast cancer cells are characterized by high polyamine uptake, while MCF10A cells demonstrate low polyamine uptake.

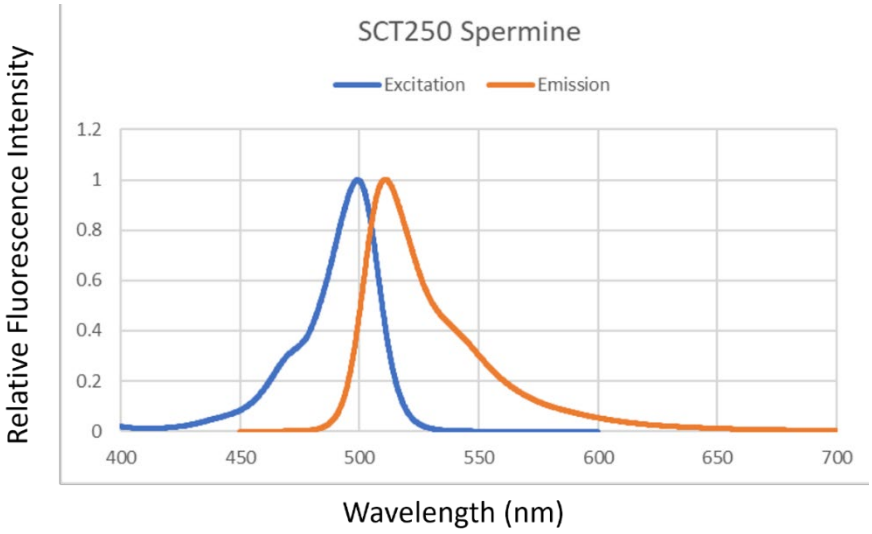

Figure 2: Probe excitation (blue) and emission (orange) spectral data. 7 µL of probe at stock concentration (10 mM) was diluted in 1 mL of Tris HCl buffer (10 µM, pH 7.0). Spectral scans were conducted using a PerkinElmer FL8500 Fluorescence Spectrophotometer.

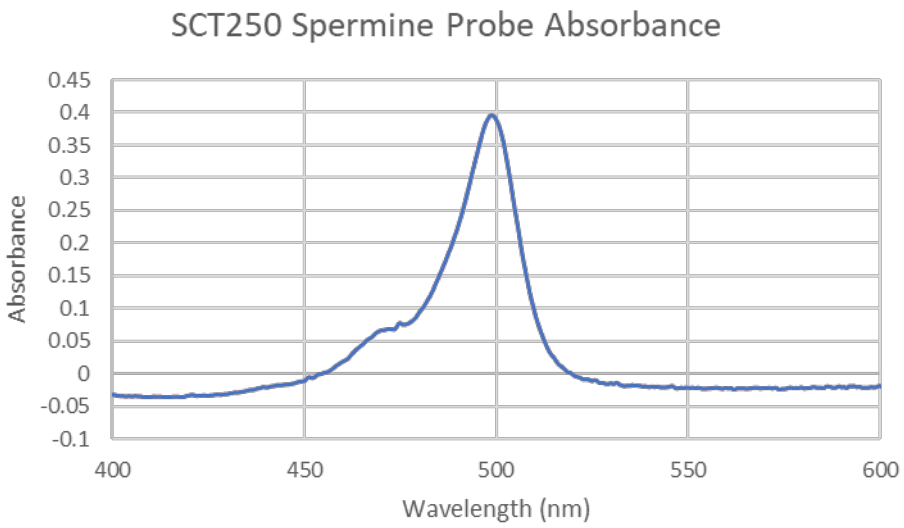

Figure 3: Probe absorbance data. 7 µL of probe at stock concentration (10 mM) was diluted in 1 mL of Tris HCl buffer (10 µM, pH 7.0). Spectral scans were conducted using a PerkinElmer FL8500 Fluorescence Spectrophotometer.

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 the room temperature and add DMSO to make a 1000X stock solution of 10 mM (freeze aliquots at –20 °C).
3. Dilute in cell culture media at a final concentration of 10 µM and add to cells in culture. Incubate at 37 °C for 3-4 hours.
4. If desired, counterstain with nuclear stain (for example, Hoechst 33342 at 0.1 mg/mL) for 10 minutes.
5. Wash cells with PBS buffer before imaging.

   Note: Optimal concentration must be determined by end user.

References

1. Vanhoutte, R., Kahler, J. P., Martin, S., van Veen, S., & Verhelst, S. H. (2018). Clickable polyamine derivatives as chemical probes for the polyamine transport system. ChemBioChem, 19(9), 907-911.
2. Li, J., Meng, Y., Wu, X., & Sun, Y. (2020). Polyamines and related signaling pathways in cancer. Cancer cell international, 20, 1-16.

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