Data Sheet

BioTracker™ Polyamine Putrescine Live Cell Probe

Live Cell Probe

SCT248

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 diverse, critical roles in the cell. Some of these processes include gene expression, cell proliferation and differentiation, and cellular stress. Polyamine dysregulation is implicated in a variety of cancers. In colorectal cancer, for example, polyamine content and biosynthesis is notably higher when compared to normal colorectal tissue. A relationship between polyamines and their metabolites has been used to observe progression in breast cancer, lung cancer, colorectal cancer, ovarian cancer, prostate cancer, and pancreatic cancer. In normal cells, there is a tight regulation of polyamines through normal cellular mechanisms. One of these mechanisms is known as the polyamine transport system (PTS), the characteristics of which are not completely understood. Further study of the PTS has shown that cancer cells have high PTS activity, indicating this system as a target for cancer research. These cellular functions emphasize the necessity for understanding polyamine systems such as the PTS.

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™ putrescine live cell dye is a putrescine moiety attached to a BODIPY fluorophore through click chemistry. The BioTracker™ putrescine live cell dye permits evaluation of polyamine uptake in live cells using the green emission channel (FITC filter).

Source

SCT248 does not contain genetically modified organisms.

Spectral Properties

Excitation: 485-505 nm

Emission: 510 nm

Quality Control Testing

Purity: ≥ 90% confirmed by HNMR, LC-MS and HPLC and elemental analysis

Molar Mass: 558.34 g/mol

Storage and Handling

Store BioTracker™ Putrescine 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. Red-brown solid.

Representative Data

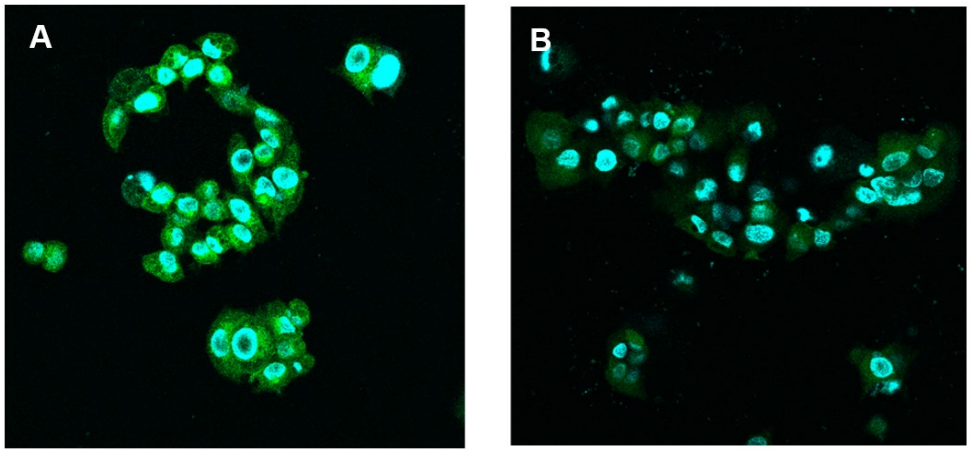

Figure 1: Confocal imaging of SCT248 putrescine probe in MCF7 breast cancer cells. Cells were treated with 10 µM putrescine probe for 3 hours at 37 °C and counterstained with Hoechst 33342 nuclear dye for 10 minutes. (**A**) Cytoplasmic and perinuclear staining of putrescine dye is observable (green), indicating uptake of putrescine. (**B**) Cells were pre-treated with 100 µM of an inhibitor of polyamine uptake, benzyl viologen, overnight at 37 °C before being stained with 10 µM putrescine dye. Inhibition of polyamine transport system results in substantially reduced putrescine uptake.

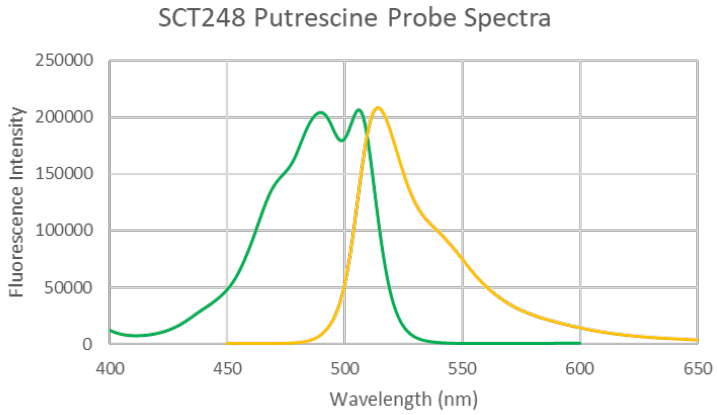

Figure 2: Probe excitation and emission data. 7 µL of probe at stock concentration (10 mM) was diluted in 1 mL of Tris HCl buffer (10 µM, pH 7.0). Spectral scans were conducted using a PerkinElmer FL8500 Fluorescence Spectrophotometer.

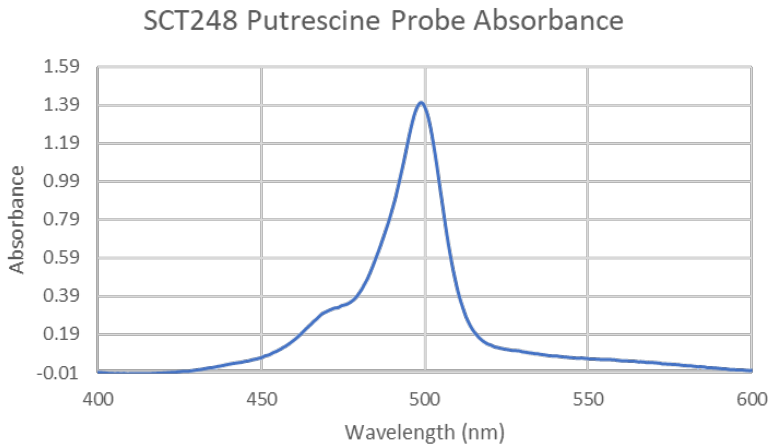

Figure 3: Probe absorbance data. 7µL of probe at stock concentration (10 mM) was diluted in 1 mL of Tris HCl buffer (10 µM, pH 7.0). Spectral scans were conducted using a PerkinElmer FL8500 Fluorescence Spectrophotometer.

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 180 µL DMSO to make a 1000X stock solution of 10 mM (freeze aliquots at –20 °C).
3. Dilute probe stock solution in cell culture media to a final concentration of 10 µM and add to cells in culture. Incubate at 37 °C for 4 hours.
4. If desired, counterstain with nuclear dye (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.
3. Van Veen, S., Kourti, A., Ausloos, E., Van Asselberghs, J., Van den Haute, C., Baekelandt, V., Eggermont, J. Vangheluwe, P. (2023). ATP13A4 upregulation drives the elevated polyamine transport system in the breast cancer cell line MCF7. Biomolecules 13(6):918.

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