Data Sheet

BioTracker™ DACP-2 GSH Cys Dual Live Cell Dye

Live Cell Probe

SCT061

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

Biothiols include cysteine (Cys), homocysteine (Hcy), and glutathione (GSH). These play crucial and ubiquitous roles in biological systems as endogenous species. GSH is a vital antioxidant and the most abundant intracellular biothiol. Substandard levels of GSH concentration are closely related to oxidative stress and several diseases. Cys is a building block for protein synthesis; Cys is positioned in many active sites of proteins due to the reactivity of its sulfhydryl group. Abnormal levels of Cys may play an important part in various symptoms and diseases.

The BioTracker™ DACP-2 GSH Cys dual live cell probe is selective for GSH in the red region and for cysteine/homocysteine (Cys/Hcy) in the green region. When treated with GSH, DACP-2 showed strong fluorescence enhancement in comparison to that for closely related species such as amino acids, including Cys/Hcy. Competing fluorescent enhancements upon addition of closely related species were negligible. DACP-2 demonstrated fast responses, improved water solubility, and good cell membrane permeability. Live human lung cancer cells and fibroblasts imaged by confocal microscopy, as well as live mice tumor model imaging, confirmed selective detection.

Source

The BioTracker™ DACP-2 GSH Cys Dual Live Cell Dye (SCT061) does not contain genetically modified organisms.

Spectral Properties

- Absorbance: 510 nm
- GSH Excitation: 520 nm
- GSH Emission: 580 nm
- Cys Excitation: 395 nm
- Cys Emission: 510 nm

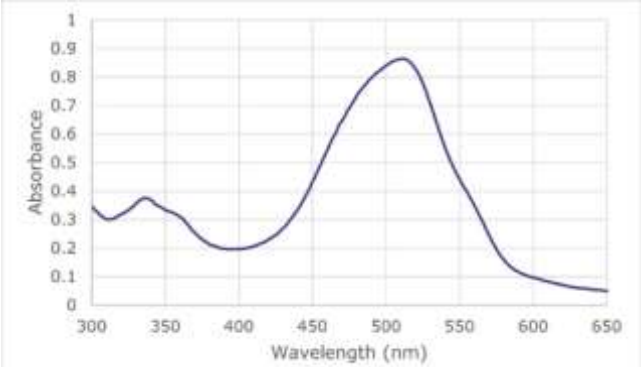

Figure 1: Probe absorbance data. 5 µL of probe at stock concentration (10 mM) was diluted in 1 mL of solution (PBS pH 7.4 with 10% DMSO) before undergoing an absorbance scan. Spectral scans were conducted using a PerkinElmer FL8500 Fluorescence Spectrophotometer.

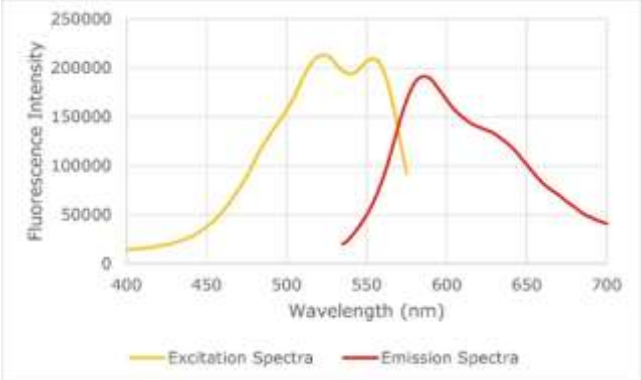

Figure 2: Probe excitation and emission data (GSH-activated spectra). 5 µL of probe at stock concentration (10 mM) was diluted in 1 mL of solution (PBS pH 7.4+100 µM GSH) before undergoing excitation and emission scans. Spectral scans were conducted using a PerkinElmer FL8500 Fluorescence Spectrophotometer.

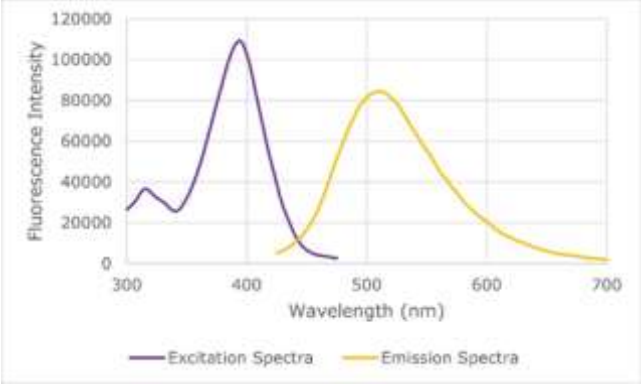

Figure 3: Probe excitation and emission data (Cys-activated spectra). 5 µL of probe at stock concentration (10 mM) was diluted in 1 mL of solution (Tris buffer pH 8.0 with 10% DMSO+100 µM cysteine) before undergoing excitation and emission scans. Spectral scans were conducted using a PerkinElmer FL8500 Fluorescence Spectrophotometer.

Quality Control Testing

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

Molar Mass: 538.49 g/mol

Storage and Handling

Store BioTracker™ DACP-2 GSH Cys Dual Live Cell Dye 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

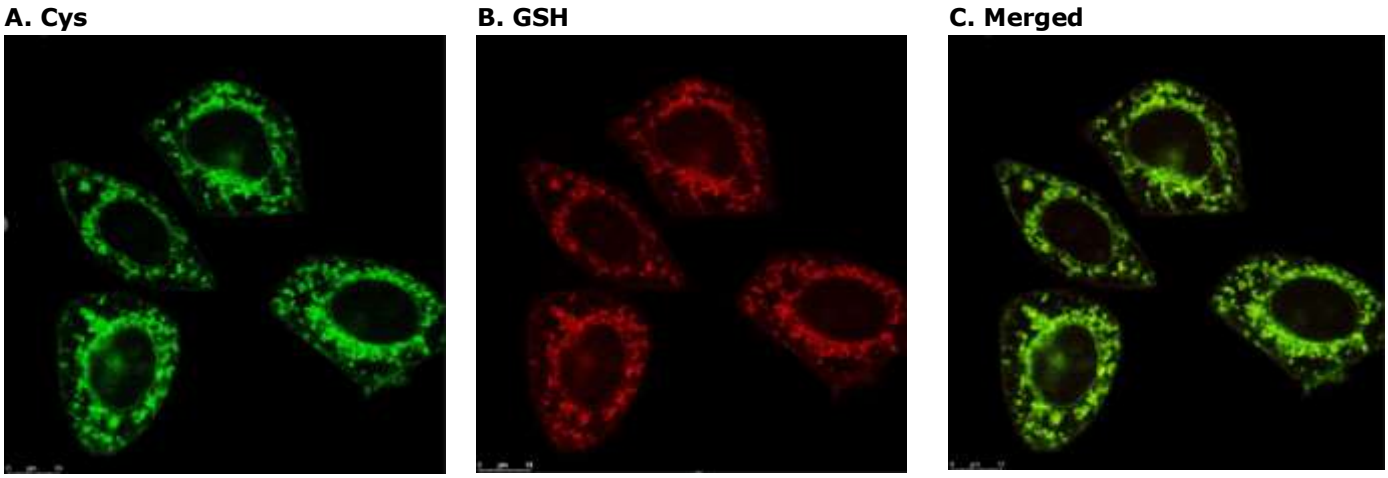

Figure 4: Confocal images of HeLa cells stained with 10 µM DACP-2 live cell dye for 30 minutes.

Protocols

Preparing BCC dye stock solution

Prepare the DACP-2 probe (Molecular Weight: 538.49 g/mol) stock solution by dissolving the contents of one vial (1 mg) in 186 µL of DMSO to create a 10 mM solution. Stock solution should be stored at ≤ −20 °C for longer periods.

Labeling cells

1. Culture cells in an appropriate medium and vessel for fluorescence microscopy.
2. Prepare the DACP-2 staining solution by diluting the DACP-2 stock solution 1:1000 in culture medium.
3. Remove the medium.
4. Add sufficient staining solution to cover the cells.
5. Incubate for 30 minutes protected from light (no wash step).
6. Image the cells.

References

1. Mulay SV, Kim Y-S, Choi M, Dong Ho Lee, Choi J, Lee Y, Jon S, Churchill DG. 2018. Enhanced Doubly Activated Dual Emission Fluorescent Probes for Selective Imaging of Glutathione or Cysteine in Living Systems. Analytical Chemistry. 90(4):2648–2654. doi:https://doi.org/10.1021/acs.analchem.7b04375.

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