Data Sheet

BioTracker™ DCM-βgal Live Cell Dye

Live Cell Probe

SCT050

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

The BioTracker™ DCM-βgal live cell probe is a ratiometric near-infrared (NIR) dye for the real-time fluorescent quantification of beta-galactosidase (βgal) enzyme activity *in vitro*, *in vivo* and *in situ*.

β-galactosidase is an important marker for cell senescence and for primary ovarian cancers. BioTracker™ DCM-βgal live cell dye has light-up ratiometric NIR fluorescence characterized by a large Stokes shift, higher photostability than commercial ICG, and pH independency under the physiological range allowing for the real-time evaluation of βgal activity. DCM-βgal displays higher affinity for βgal than is demonstrated by commercial X-gal, and a faster response to βgal than the previously reported FDG probe.

Source

The BioTracker™ DCM-βgal Live Cell Dye (SCT050) does not contain genetically modified organisms.

Spectral Properties

Excitation max: 560 nm

Emission max: 695 nm

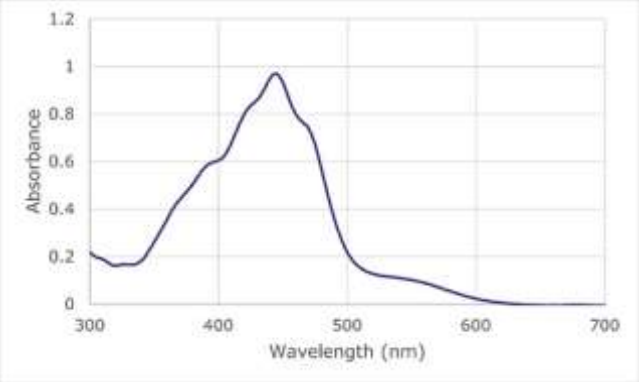

Figure 1: Probe absorbance data. 3 µL of probe at stock concentration (10 mM) was diluted in 1 mL of solution (PBS pH 7.4/DMSO 7:3 v/v) in addition to 12 U of βGal (G6008). Probe solution was incubated for 45 minutes at 37 °C before undergoing an absorbance scan. Spectral scans were conducted using a PerkinElmer FL8500 Fluorescence Spectrophotometer.

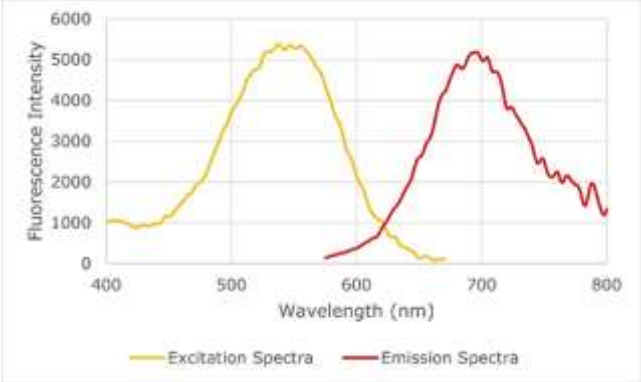

Figure 2: Probe excitation and emission data. 3 µL of probe at stock concentration (10 mM) was diluted in 1 mL of solution (PBS pH 7.4/DMSO 7:3 v/v) in addition to 12 U of βGal (G6008). Probe solution was incubated for 45 minutes at 37 °C before undergoing excitation and emission scans. Spectral scans were conducted using a PerkinElmer FL8500 Fluorescence Spectrophotometer.

Quality Control Testing

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

Molar Mass: 474.5 g/mol

Storage and Handling

Store BioTracker™ DCM-βGal 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. Yellow solid.

Representative Data

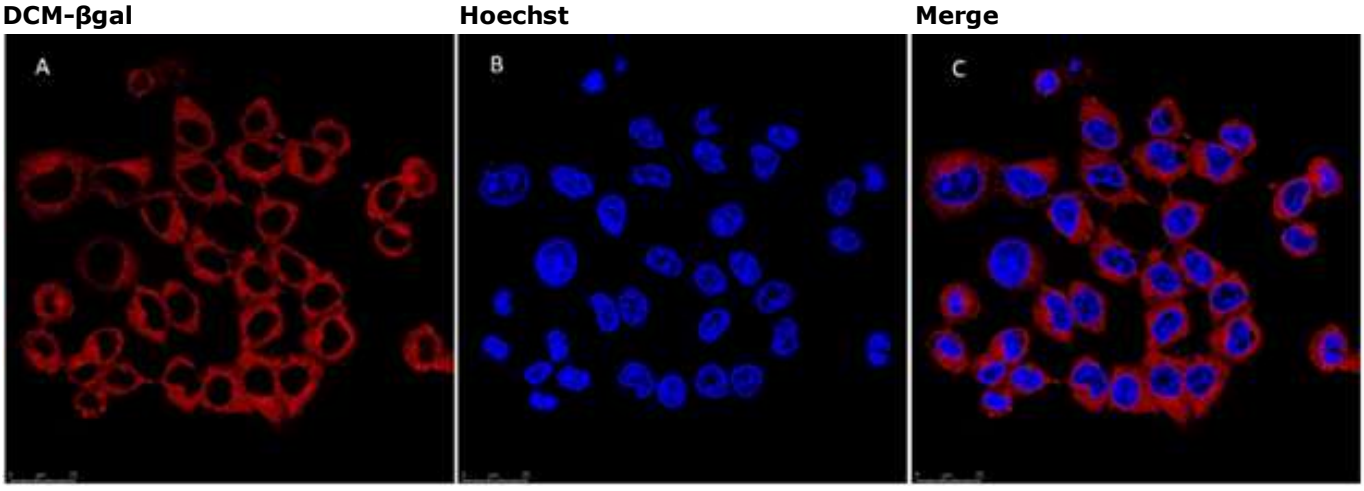

Figure 3: Confocal microscopy image of β-galactosidase staining. HeLa cells were cultured and stained with 10 µM DCM-βGal dye solution for (**A**) βgal, co-stained with (**B**) Hoechst nuclear dye and (**C**) merged.

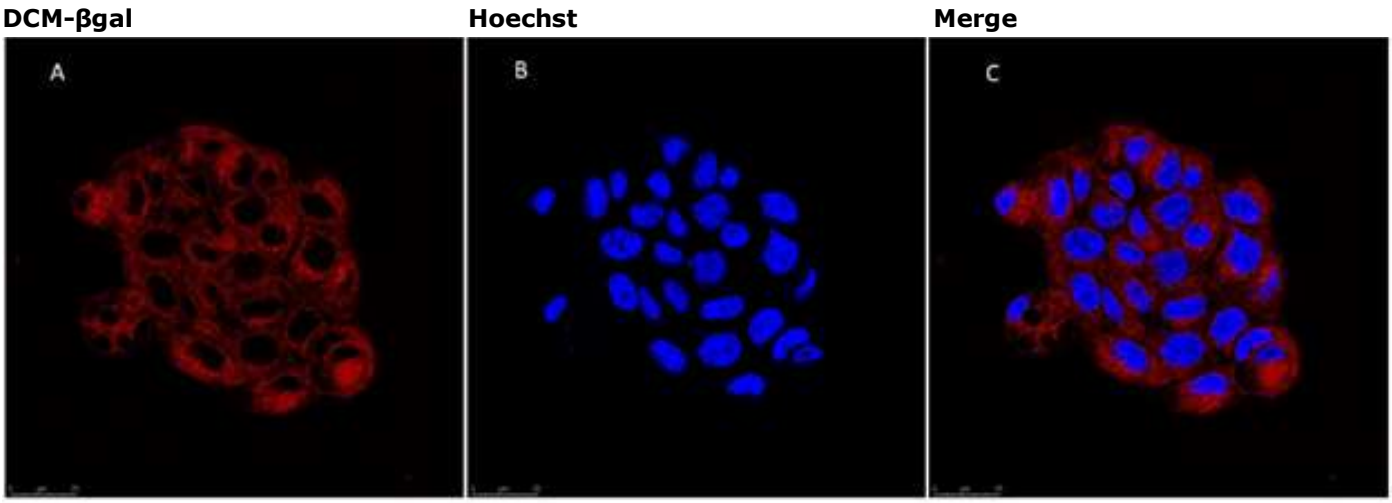

Figure 4: Confocal microscopy image of β-Galactosidase staining. OVCAR-3 cells were cultured and stained with 10 μM DCM-βGal dye solution for (**A**) βgal, co-stained with (**B**) Hoechst nuclear dye, and (**C**) merged.

Protocols

Preparing BioTracker™ DCM-βGal live cell dye stock solution

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. Prepare the DCM-βgal (Molecular Weight: 474.5 g/mol) dye stock solution by dissolving the contents of one vial (1 mg) in 211 μL of DMSO to create a 10 mM solution.
3. Aliquot and store stock solution at −20 °C or below.

Labeling cells

1. Culture cells in an appropriate medium and vessel for fluorescence microscopy.
2. Prepare the DCM-βgal staining solution by diluting the DCM-βgal stock solution 1:1000 in culture medium.
3. Remove the cell culture medium from the cells.
4. Add sufficient staining solution to cover the cells.
5. Incubate for 30 minutes, protected from light.
6. Observe the cells under fluorescence microscope for NIR fluorescence: λ_{ex} = 560 nm, λ_{em} = 605~725 nm.

   Note: Optimal concentration must be determined by end user.

References

1. Gu K, Xu Y, Li H, Guo Z, Zhu S, Zhu S, Shi P, James TD, Tian H, Zhu W-H. 2016. Real-Time Tracking and In Vivo Visualization of β-Galactosidase Activity in Colorectal Tumor with a Ratiometric Near-Infrared Fluorescent Probe. Journal of the American Chemical Society. 138(16):5334–5340. doi:https://doi.org/10.1021/jacs.6b01705.

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