Data Sheet

BioTracker™ NIR Amyloid-β Plaque Imaging Dye

Tissue Probe

SCT073

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

Alzheimer's disease (AD) is an incurable, progressive neurodegenerative brain disorder. The formation and accumulation of amyloid-β (Aβ) plaques in the brain is thought to be a critical pathological hallmark for early diagnosis of AD. Current gold standard probes for histological staining of amyloid fibrils, such as thioflavin derivatives, have several drawbacks. These probes suffer from high background noise, limited blood-brain-barrier (BBB) penetration, and distorted signals.

BioTracker™ NIR Amyloid-β Plaque Imaging Dye is an aggregation-induced-emission (AIE) active probe that can be used to detect amyloid-β plaques both *in vivo* and *ex vivo*. This probe has been tested in mouse models of AD, as well as *ex vivo* brain tissue sections. This fluorescent probe features (1) ultrahigh signal-to-noise (S/N) ratio with integrating background minimization and fidelity signal amplification, (2) remarkable binding affinity to Aβ plaques with efficient BBB penetrability, and (3) NIR AIE-active emission with excellent photostability.

Source

The BioTracker™ NIR Amyloid-β Plaque Imaging Dye (SCT073) does not contain genetically modified organisms.

Spectral Properties

Excitation: 530 nm

Emission: 780-820 nm

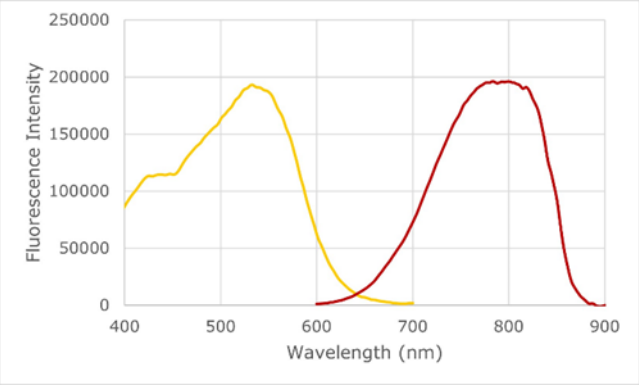

Figure 1. Probe excitation and emission data. 7 µL of probe at stock concentration (3 mM) was diluted in 1 mL of DMSO before undergoing excitation and emission scans. Spectral scans were conducted using a PerkinElmer FL8500 Fluorescence Spectrophotometer.

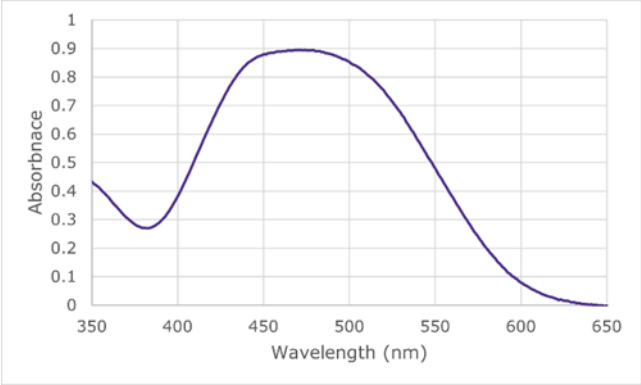

Figure 2. Probe absorbance data. 7 µL of probe at stock concentration (3 mM) was diluted in 1 mL of DMSO before undergoing an absorbance scan. Spectral scans were conducted using a PerkinElmer FL8500 Fluorescence Spectrophotometer.

Quality Control Testing

Purity: ≥ 97% confirmed by HPLC. Structure confirmed by HNMR, FNMR, LC-MS and elemental analysis.

Molar Mass: 564.7 g/mol

Storage and Handling

Store BioTracker™ NIR Amyloid-β Plaque Imaging 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

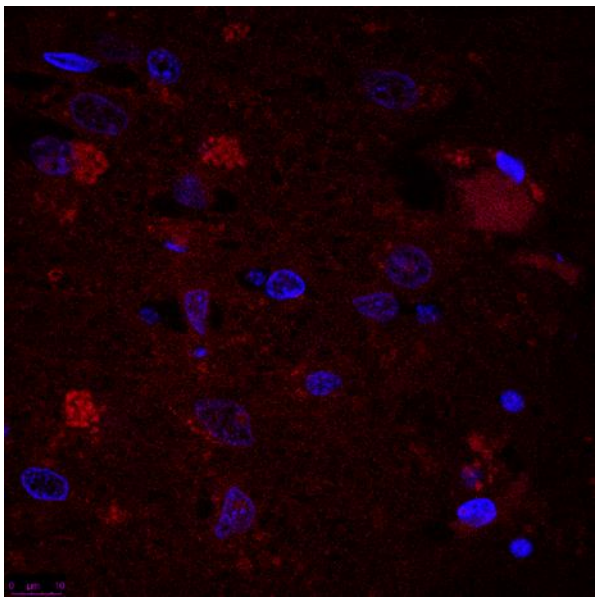

Figure 3. Human Alzheimer's disease brain tissue slides were prepared and stained with 100 µM NIR Amyloid-β (Red) plaque imaging dye for 30 minutes. Slide was mounted with ProLong® Gold antifade with DAPI (Blue).

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. Wash tissue slides with deionized water and equilibrate in 1 mg/mL Sodium borohydride for 20 minutes then equilibrate in PBS for 10 minutes.
4. Dilute NIR Amyloid-β plaque imaging dye to 100 µM in PBS and add to brain tissue slides. Incubate for 30 minutes at room temperature.
5. Rinse slides in 1X PBS and mount cover slide with mounting media.
6. Allow slides to cure for 30 minutes at room temperature. Slides are ready to image.

   Note: Optimal concentration must be determined by end user.

References

1. Fu W, Yan C, Guo Z, Zhang J, Zhang H, Tian H, Zhu W-H. 2019. Rational Design of Near-Infrared Aggregation-Induced-Emission-Active Probes: *In Situ* Mapping of Amyloid-β Plaques with Ultrasensitivity and High-Fidelity. Journal of the American Chemical Society. 141(7):3171–3177. doi:https://doi.org/10.1021/jacs.8b12820.

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