Data Sheet

BioTracker™ MultiTASQ G-quadruplex G4 Cell Probe

SCT247

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

G-quadruplexes are four-stranded structures comprising stacked G tetrads (G4) formed within certain guanine-rich nucleic acid sequences. G-quadruplexes are enriched in open chromatin regions but are also present in the nucleolus, ribosomal regions, and cytoplasm. The formation of G4 structures is dynamic and cell-type specific, suggestive of interaction with transcription factors and other proteins.[1] For this reason G-quadruplexes have garnered intense interest for their potential functions in transcriptional regulation.

The BioTracker™ MultiTASQ G-quadruplex G4 Cell Probe is optimized for cellular detection of G-quadruplexes. MultiTASQ was designed utilizing the template-assembled synthetic G-quartets (TASQ) concept as biomimetic ligand for G-quadruplexes, demonstrating high specificity for G4. MultiTASQ is water-soluble and exhibits a high degree of intracellular accessibility. MultiTASQ detects ribosomal RNA-G4 associated with perinuclear rough ER regions to a greater degree compared to BG4 antibody. MultiTASQ is an alkynylated probe that allows for background-free detection via click chemistry and is suitable for G4 capture chemi-precipitation and click imaging applications. MultiTASQ is compatible with live-cell incubation. The BioTracker™ MultiTASQ G4 Cell Probe is a uniquely designed, versatile tool for G4 detection and analysis.

Source

BioTracker™ MultiTASQ G-quadruplex G4 Cell Probe (SCT247) does not contain genetically modified organisms.

Spectral Properties

This probe is non-fluorescent. Probe may be detected using click (copper-catalyzed cycloaddition) imaging with appropriate click chemistry reagents.

Quality Control Testing

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

Molar Mass: 1800 g/mol

Storage and Handling

Store BioTracker™ MultiTASQ G-quadruplex G4 Cell Probe at –20 °C, desiccated and protected from light.

Note: Centrifuge vial briefly to collect contents at bottom of vial before opening.

Representative Data

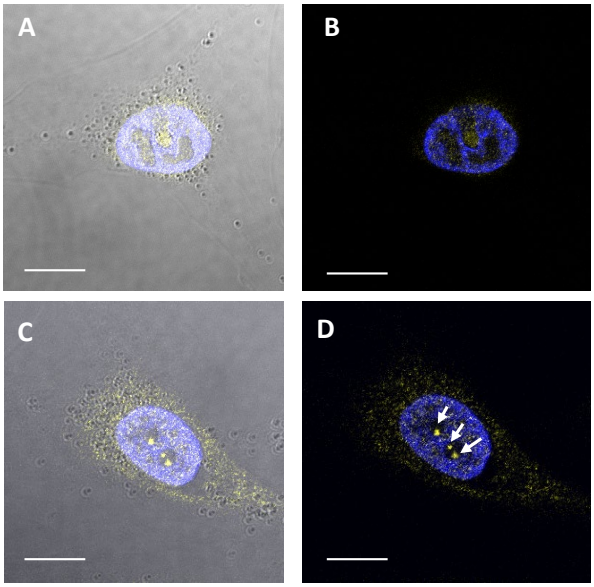

Figure 1. Confocal microscopy images of G4 foci in HeLa cells detected with anti-DNA G-quadruplex structure BG4 antibody (MABE917) and anti-FLAG antibody (MAB3118, yellow), co-stained with DAPI nuclear dye (blue). (**A**, **B**) No BG4 control vs (**C**, **D**) BG4 stained cells. (**A**, **C**) overlay with brightfield images. White arrows indicate G4 foci in nucleus.
Scale bars: 10 µM

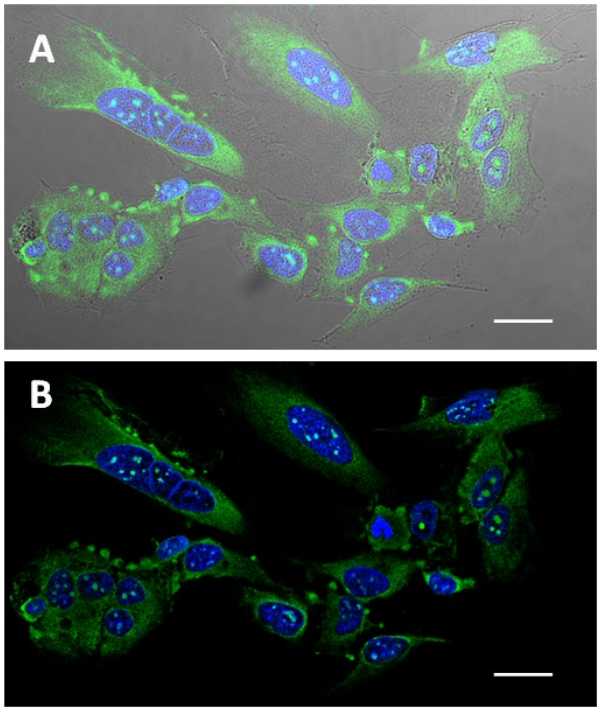

Figure 2. Confocal microscopy images of G-quadruplexes detected with MultiTASQ. HeLa cells were incubated with MultiTASQ then fixed and incubated with Atto-488-conjugated azide (72709, green) and co-stained with DAPI nuclear dye (blue). (**A**) overlay with brightfield; (**B**) overlay. Nucleolar, perinuclear, and cytoplasmic foci and diffuse staining is observed.
Scale bars: 25 µM

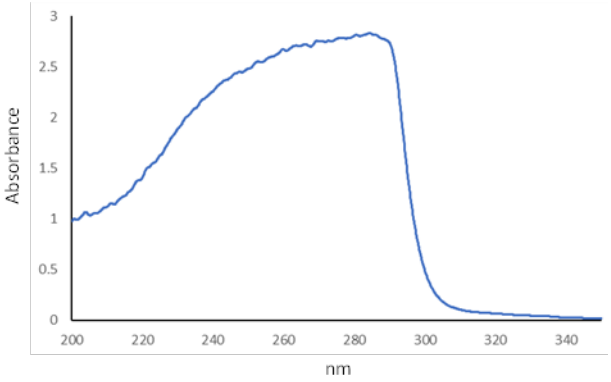

Figure 3. Absorption spectrum of BioTracker™ MultiTASQ G-quadruplex G4 Cell Probe (SCT247) in water.

Protocols

Preparing BioTracker™ MultiTASQ G4 Cell Probe 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 the room temperature. Prepare the MultiTASQ (Molecular Weight: 1800 g/mol) probe stock solution by dissolving the contents of one vial (1 mg) in 1.8 mL of water to create a 1 mM solution.
3. Aliquot and store stock solution at –20 °C or below for longer-term storage.

Preparing Click Reaction Buffer

Prepare a solution of PBS containing 0.05% (v/v) IGEPAL® CA-630 (I3021), 10 mM sodium ascorbate (A4034), and 1 mM copper sulfate (209198).

Labeling cells

1. Culture cells in an appropriate medium and vessel for fluorescence microscopy.
2. Prepare the MultiTASQ staining solution by diluting the MultiTASQ stock solution 1:1000 in growth medium (1 µM final concentration).
3. Add sufficient staining solution to cover the cells and incubate for 24 hours at 37 °C in 5% CO_2 humidified incubator.
4. Wash cells 3 times for 5 minutes with PBS.
5. Fix cells (for example, ice-cold methanol for 10 minutes).
6. Wash cells 3 times for 5 minutes with PBS.
7. Incubate cells with 1 µM fluorophore-conjugated azide (for example, Atto488-azide, 72709) in click reaction buffer for 1 hour at ambient temperature.
8. Wash cells for 5 minutes with PBS. If desired, counterstain with DAPI (1 µg/mL) for 10 minutes at ambient temperature.
9. Image cells on fluorescence microscope at wavelengths appropriate for fluorophores used.

Presentation

Lyophilized. White solid.

References

1. Nat. Chem. 2021, 13(7): 626-633.
2. ACS Chem Biol. 2021, 16(5): 905-914.

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