Data Sheet

BioTracker™ BioCyTASQ G-quadruplex (G4)

Cell Probe

SCT246

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 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-quarduplexes have garnered intense interest for their potential functions in transcriptional regulation.

The BioTracker™ BioCyTASQ G-quadruplex G4 Cell Probe is optimized for cellular detection of G-quadruplexes. The BioCyTASQ probe utilizes the template-assembled synthetic G-quartets (TASQ) concept as a biomimetic ligand for G-quadruplexes, a design which results in high specificity for folded G4. BioCyTASQ is water-soluble and demonstrates robust intracellular accessibility. BioCyTASQ detects ribosomal RNA-G4 associated with perinuclear rough ER regions to a greater degree compared to BG4 antibody. The biotin moiety on the BioCyTASQ molecule enables detection with streptavidin. BioCyTASQ is suitable for G4 capture pull-down assays as well as cellular imaging.[2] BioCyTASQ G4 Cell Probe is not recommended for live cell imaging applications. The optimized design of the BioTracker™ BioCyTASQ G-quadruplex G4 cell probe makes it a powerful tool for biochemical and cellular analysis of G4.

Source

BioTracker™ BioCyTASQ G-quadruplex G4 Cell Probe (SCT246) does not contain genetically modified organisms.

Spectral Properties

This probe is non-fluorescent. Probe may be imaged using fluorophore-conjugated streptavidin.

Quality Control Testing

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

Molar Mass: 968 g/mol

Storage and Handling

Store BioTracker™ BioCyTASQ 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.

Presentation

Lyophilized. White solid

Representative Data

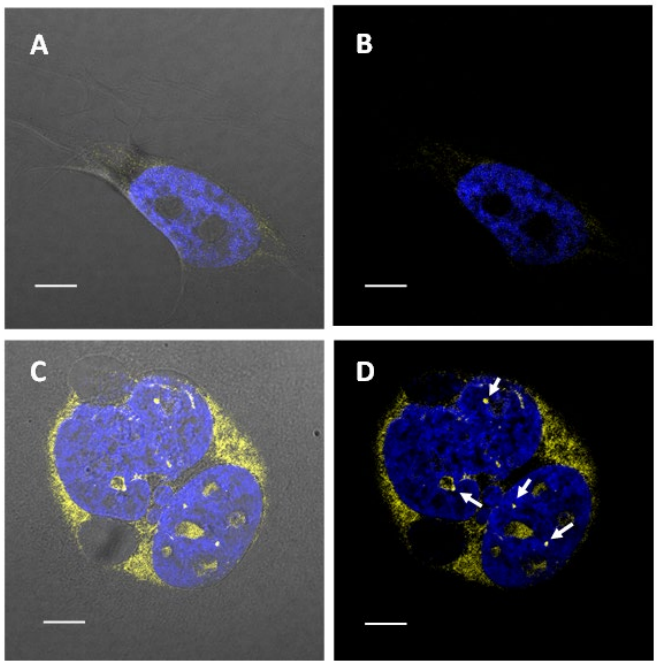

Figure 1. Confocal microscopy images of G-quadruplexes detected with BioCyTASQ. Paraformaldehyde-fixed HeLa cells were incubated without (**A**, **B**) or with BioCyTASQ (**C**, **D**), then incubated with Cy3-conjugated streptavidin (S6402, yellow), co-stained with DAPI nuclear dye (90225, blue) and merged together. (**A**, **C**) overlay with brightfield images. White arrows indicate location of G4 foci. Perinuclear staining is associated with RNA-G4 in rough endoplasmic reticulum.

Scale bars: 10 µM

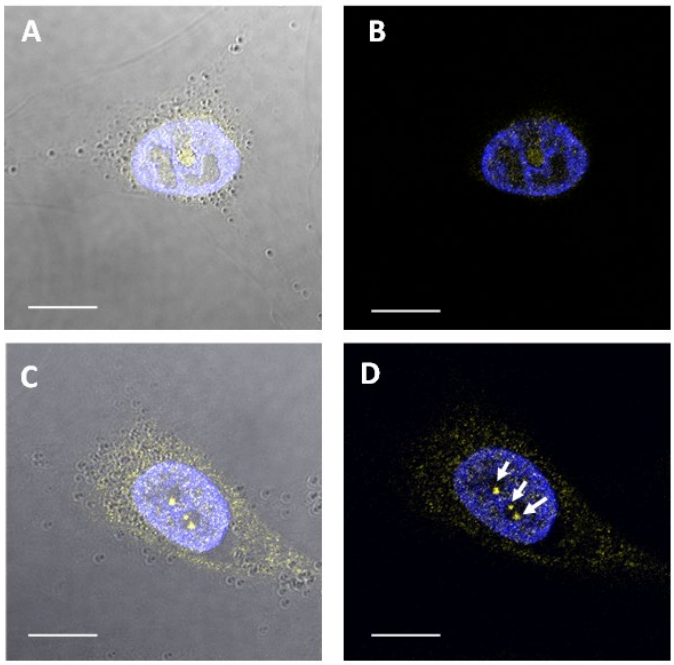

Figure 2. Confocal microscopy images of G4 foci in HeLa cells detected with anti-DNA G-quadruplex structure BG4 antibody (MABE917) and anti-FLAG antibody (MAB3118, yellow), co-stained with DAPI nuclear dye (blue). No BG4 control (**A**, **B**) versus BG4 stained cells (**C**, **D**). (**A**, **C**) overlay with brightfield images. White arrows indicate G4 foci in nucleus.

Scale bars: 10 µM

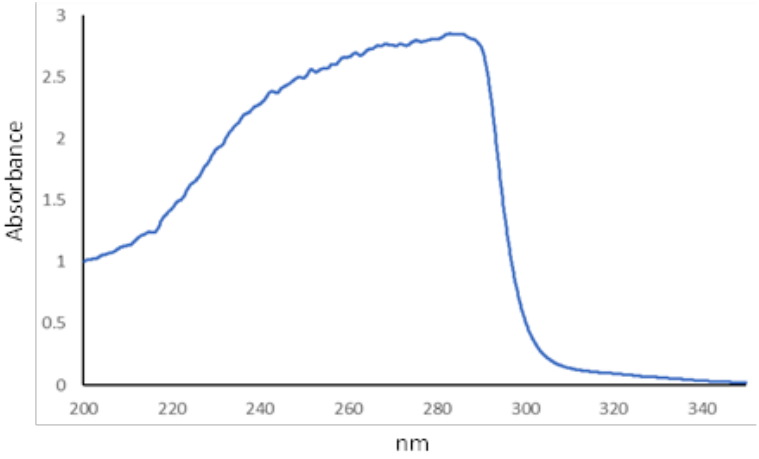

Figure 3. Absorption spectrum of SCT246 BioCyTASQ in water.

Protocols

Preparing BioTracker BioCyTASQ 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 BioCyTASQ (Molecular Weight: 968 g/mol) probe stock solution by dissolving the contents of one vial (1 mg) in 968 µL of water to create a 1 mM solution.
3. Aliquot and store stock solution at –20 °C or below for longer-term storage.

Labeling cells

1. Culture cells in an appropriate medium and vessel for fluorescence microscopy.
2. Prepare the BioCyTASQ staining solution by diluting the BioCyTASQ stock solution 1:1000 in PBS (1 µM final concentration).
3. Fix cells in 4% paraformaldehyde.
4. Permeabilize cells with PBS + 0.1% (v/v) Triton® X-100 for 10 minutes at ambient temperature.
5. Add sufficient BioCyTASQ staining solution to cover the cells and incubate for 1 hour at ambient temperature.
6. Wash cells 3 times for 5 minutes with PBS.
7. Fix cells (for example, ice-cold methanol for 10 minutes).
8. Wash cells 3 times for 5 minutes with PBS.
9. Incubate cells with 1 µg/mL fluorophore-conjugated streptavidin (for example, Cy3-streptavidin, S6402) in PBS for 1 hour at ambient temperature.
10. Wash cells for 5 minutes with PBS. If desired, counterstain with DAPI (1 µg/mL) for 10 minutes at ambient temperature.
11. Image cells on fluorescence microscope at wavelengths appropriate for fluorophores used.

    Note: Optimal concentration must be determined by end user.

References

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

Notice

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