

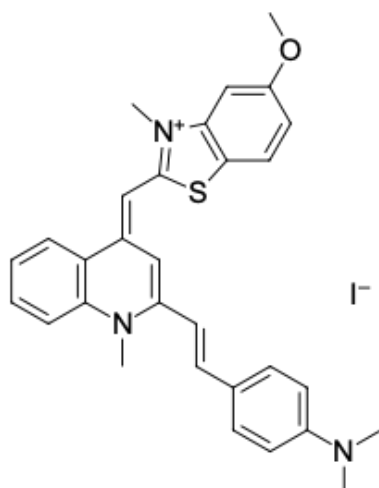
TOR-G4, G-quadruplexes fluorescent probe

<http://www.lumiprobe.com/p/tor-g4-g-quadruplexes-probe>

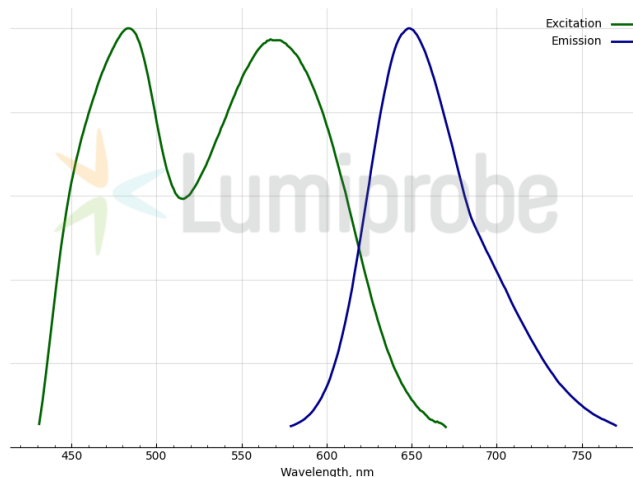
G-quadruplexes (G4s) are secondary structures that form in DNA and RNA through noncanonical hydrogen bonding between four guanine bases^[1,2]. In the nucleus, DNA G4s have been associated with epigenetic regulation of gene expression through their interactions with regulatory proteins, such as transcription factors and chromatin modifiers^[3,4]. RNA G4s have been linked to RNA splicing, transport, and translation regulation, as well as RNA-mediated stress responses in the cytoplasm^[5-7].

TOR-G4 is a thiazole orange derivative, a newly synthesized G4 fluorescent probe^[8]. It is a small-molecule alternative to immunochemistry with G4-specific antibodies. TOR-G4 allows the visualization of G4s based on changes to the fluorescence lifetime of a probe upon nucleic acid binding. The lifetime of TOR-G4 is highest in the presence of G4s and lower for other sequences. Within cells, TOR-G4 is primarily colocalized with RNA in the cytoplasm and nucleoli, making it the first lifetime-based probe validated for exploring the emerging roles of RNA G4s in cell functioning. TOR-G4 is suitable for imaging RNA G4s via FLIM^[8].

^[1] Trends in Chemistry 2, 123 (2020); ^[2] Nat Rev Mol Cell Biol 21, 459 (2020); ^[3] Nucleic Acids Res 49, 8419 (2021); ^[4] Trends Genet 35, 29 (2019); ^[5] Nucleic Acids Res 48, 12534 (2020); ^[6] Trends Biochem Sci 46, 270 (2021); ^[7] Nucleic Acids Res 49, 5426 (2021); ^[8] J Am Chem Soc 146, 1009 (2024).



Structure of TOR-G4



Excitation and emission spectra of TOR-G4 (G4 DNA (c-MYC))

General properties

Appearance:	black solid
Molecular weight:	607.56
Molecular formula:	C ₃₀ H ₃₀ IN ₃ OS
Solubility:	good in DMSO
Quality control:	NMR ¹ H and HPLC-MS (95+%)
Storage conditions:	24 months after receipt at -20°C in the dark. Transportation: at room temperature for up to 3 weeks. Desiccate.
Legal statement:	This Product is offered and sold for research purposes only. It has not been tested for safety and efficacy in food, drug, medical device, cosmetic, commercial or any other use. Supply does not express or imply authorization to use for any other purpose, including, without limitation, in vitro diagnostic purposes, in the manufacture of food or pharmaceutical products, in medical devices or in cosmetic products.

Spectral properties

Excitation/absorption maximum, nm:	483; 567 (c-MYC complex)
Emission maximum, nm:	648 (c-MYC complex)