

DFHBI-1T

(Z)-4-(3,5-difluoro-4-hydroxybenzylidene)-2-methyl-1-(2,2,2-trifluoroethyl)-1*H*-imidazol-5(4*H*)-one

Cat. no. 410-1 mg



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Product

DFHBI-1T is a non-fluorescent dye that consists of an 1,1,1-trifluoroethyl substituent on the imidazolone ring of the DFHBI fluorophore. Upon binding to the Spinach2™ aptamer, DFHBI-1T is converted to a highly fluorescent state that can be detected at the emission wavelength of 505 nm. DFHBI-1T is cell-permeable with negligible toxicity in living cells and can be used to label any genetically encoded Spinach2™-RNA sequence. DFHBI-1T has been found to have lower background fluorescence than DFHBI and exhibits an overall increase in brightness. Possible applications in living cells include RNA trafficking and subcellular localization, RNA-RNA and RNA-protein interactions, and simultaneous imaging of multiple RNAs using fluorescence microscopy.

Presentation

Each vial contains 1 mg lyophilized DFHBI-1T dye. Resuspension in DMSO at 20-40 mM concentration is recommended before transferring to the desired experimental buffer. DFHBI can also be resuspended in water [pH >9.0] at 100 μM. Once all the dyes are in solution, titrate back to neutral pH to ensure stability.

Storage

Store at -20 °C. Stable for 2 years at -20 °C from the date of shipment. Non-hazardous. No MSDS needed.

Spectral characteristics

Excitation maximum: 482 nm
Emission maximum: 505 nm
Extinction coefficient ($M^{-1} cm^{-1}$)^a: 31,000
Quantum yield: 0.94
 K_D : 560 nm
Brightness^b: 184

^a Extinction coefficient of Spinach2™-DFHBI-1T complex was measured at 7.4, where all species were in the phenolate form.

^b Brightness is reported relative to Spinach2-DFHBI.

Data

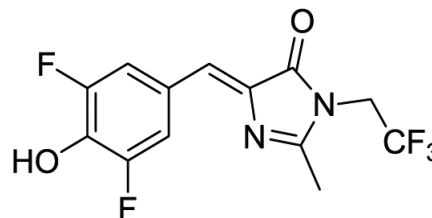


Figure 1. Structure of DFHBI-1T. MW = 320.21 g/mol

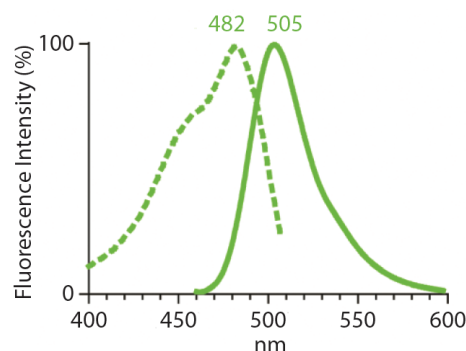


Figure 2. Excitation and emission spectra of DFHBI-1T/Spinach2™ complex.

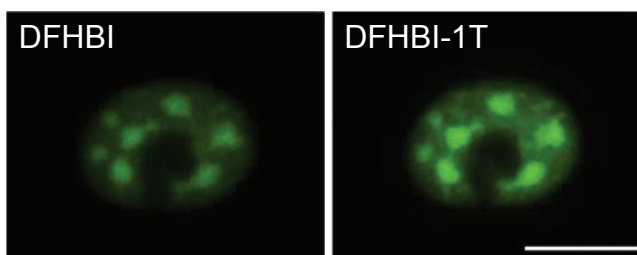


Figure 3. Live-cell imaging of a COS7 cell expressing CGG₆₀-Spinach2™ in the presence of either 20 μM DFHBI or DFHBI-1T. The images were acquired using a 100 msec exposure with a GFP filter set.

Reference

Song W, Strack RL, Svensen N, Jaffrey SR. 2014. Plug-and-Play Fluorophores Extend the Spectral Properties of Spinach. *JACS* 136(4):1198-1201.