DFHBI-1T

(Z)-4-(3,5-Difluoro-4-Hydroxybenzylidene)-2-Methyl-1-(2,2,2-Trifluoroethyl)-1H-Imidazol-5(4 H)-One

Cat. No. 410-1mg/5mg/10mg

LUCERNA™

www.lucernatechnologies.com

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 Spinach™ aptamer family, 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 Spinach™, Spinch2™, and Broccoli™ RNA tags. DFHBI-1T has been found to have lower background fluorescence than DFHBI and exhibits an overall increase in brightness in living cells. Further, DFHBI-1T can also selectively detect tagged RNA in total RNA gel electrophoresis. Thus, bypassing the need for Northern blot analysis.

Presentation

Each vial contains lyophilized DFHBI-1T dyes. Resuspension in DMSO at 20-40 mM concentration is recommended before transferring to the desired experimental buffer. DFHBI-1T 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.

Specifications

Excitation maximum: 482 nm
Emission maximum: 505 nm
Extinction coefficient (M^{-1} cm^{-1})[a] : 35,400
Quantum yield: 0.94
K_D : 560 nM
Brightness[b] : 184

[a] Extinction coefficient of DFHBI-1T was measured buffer containing 40 mM HEPES [7.4], 100 mM KCl, 1 mM MgCl$_2$..

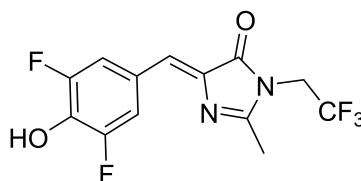[b] Brightness is relative to Spinach2™ /DFHBI

Data

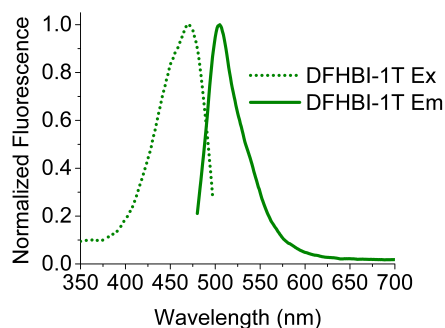Figure 1. Structure of DFHBI-1T. MW = 320.21

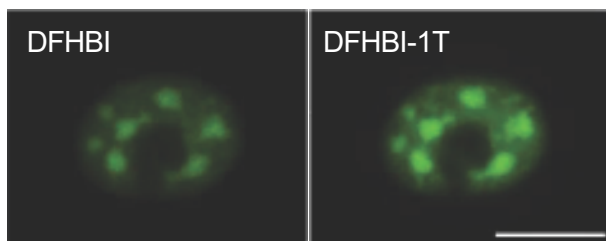Figure 2. Excitation and emission spectra of Spinach2™/DFHBI-1T complex.

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.

References

Song W, et al. 2014. Plug-and-play fluorophores extend the spectral properties of Spinach. *J Am Chem Soc* 136(4), 1198-201.

Filonov et al. 2015. In-gel imaging of RNA processing using Broccoli reveals optimal aptamer expression strategies. *Chem Biol* 22(5), 649-60.