

TO3-3PEG-Biotin Fluorophore

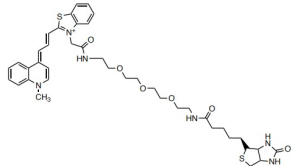
Fluorophore for the RNA Mango System

Cat. No.	Description	Quantity
G959	TO3-3PEG-Biotin Fluorophore	0.5 mg/ml (500 µl)

Description

TO3-3PEG-Biotin is a small bifunctional fluorophore that has very low unbound fluorescence. When bound to the Mango series of RNA aptamers (KCl required) it becomes up to 61-fold brighter¹, emitting in the red region of the visible spectrum. The fluorophore exhibits peak excitation maxima of 615 nm (with additional excitation when bound at 260 nm) and peak fluorescence emission of 658 nm when bound to Mango Aptamers².

Product Specifications

Structure	
Molecular Mass	889.02
Formula	C ₄₂ H ₅₁ F ₃ N ₆ O ₈ S ₂
Purity	>95% (by HPLC)
Form	0.5 mg/ml in DMF
Solubility	DMF, DMSO, 10% Acetonitrile or MeOH-CH ₂ Cl ₂
Storage	Store at -20°C. Protect from light.
Shelf life	Three (3) months from receipt.

Patent Provisional Patent Application Number 62489346

References

1. Trachman, R.J. et al. (2018). Crystal structures of the Mango-II RNA aptamer reveal heterogeneous fluorophore binding and vide engineering of variants with improved selectivity and brightness. *Biochemistry* 57, 354403548. 2. Dolgoshina, E.V. et al. (2018). RNA Mango aptamer-fluorophore: A bright, high-affinity complex for RNA labeling and tracking. *ACS Chem. Biol.* 9, 2412-2420. 3. Autour, A. et al. (2018). Fluorogenic RNA Mango aptamers for imaging small non-coding RNAs in mammalian cells. *Nat. Commun.* 9, 656. 4. Trachman III, R.J., et al. (2019). Structural and functional reselection of the Mango-III fluorogenic RNA aptamer. *Nat. Chem. Biol.* 15, 472. 5. Trachman III, R.J. & Ferre-D'Amare, A.R. (2019). Tracking RNA with light: selection, structure, and design of fluorescence turn-on RNA aptamers. *Q. Rev. Biophys.* 52. 6. Kristen Kong, Unrau laborator; unpublished data (2019).

Properties of the Fluorophore-Aptamer Complex

Excitation/Emission Wavelength (unbound)	624/647 nm
Excitation/Emission Wavelength (bound)	637/648 nm
Extinction Coefficient at 615 nm (aqueous buffer)	66,800 M ⁻³ cm ⁻¹ *
Binding Affinity to Mango I Aptamer	5.1 +/- 0.3 (nM) ³
Binding Affinity to Mango II Aptamer	1.4 +/- 0.3 (nM) ¹
Binding Affinity to Mango III Aptamer	8.7 +/- 1.6 (nM) ⁴
Binding Affinity to Mango III (A10U) Aptamer	160 +/- 22(nM) ⁴
Binding Affinity to Mango IV Aptamer	10.4 +/- 0.1 (nM) ³
Fluorescent enhancement when bound to Mango I Aptamer	35 ²
Fluorescent enhancement when bound to Mango II Aptamer	61 +/- 2 ¹
Fluorescent enhancement when bound to Mango III (A10U) Aptamer	9.9 +/- 0.3 ⁶

* When extinction coefficient is determined from fluorescent titration, the determination relies on the assumption that only one (1) bound state between fluorophore and aptamer is present. In cases when only a fraction of TO3-3PEG-Biotin is bound in a conformation that contributes to emitted fluorescence, functional extinction coefficient determined by titration significantly exceeds the value obtained from weight and absorbance measurement^{3,5}.

