

Biotin-4-Fluorescein

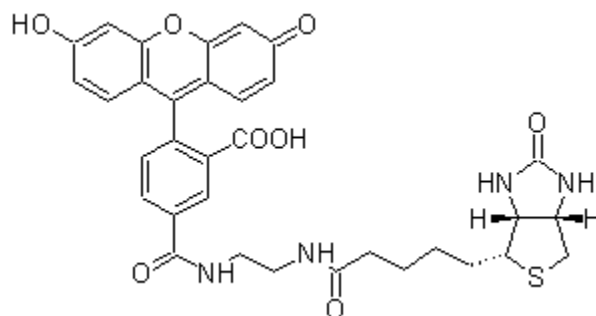
Ordering Information

Product Number: 3006 (5 mg)

Storage Conditions

Keep at -20 °C and desiccated.
Expiration date is 12 months from the date of receipt.

Chemical and Physical Properties



Molecular Weight: 644.69

Appearance: orange powder

Solvent: dimethylsulfoxide (DMSO)

Spectral Properties: Excitation = 492 nm; Fluorescence = 518 nm.

Biological Applications

This bifunctional biotin conjugate demonstrates better binding and stronger fluorescence than biotin fluorescein. It has similar avidin-binding properties in terms of high affinity, fast association, and non-cooperative binding to avidin and streptavidin tetramers. These exceptional properties are attributed to the small size/length of the new ligand since all larger/longer biotin derivatives are known for their mutual steric hindrance and anti-cooperative binding in 4:1 complexes with avidin and streptavidin tetramers. Specific binding of this biotin-fluorescein conjugate towards avidin and streptavidin is accompanied by 84-88% quenching of ligand fluorescence. It is used for the quantitation of biotin-binding sites. Both the fluorescence and absorbance of biotin-4-fluorescein are quenched upon binding to one of the four biotin-binding sites of streptavidin, or avidin conjugates of fluorescent dyes, or enzymes. As a result, the number of biotin-binding sites can be estimated when a known concentration of biotin-4-fluorescein is added to a known amount of streptavidin.

References

1. Aslan FM, Yu Y, Mohr SC, Cantor CR. (2005) Engineered single-chain dimeric streptavidins with an unexpected strong preference for biotin-4-fluorescein. *Proc Natl Acad Sci U S A*, 102, 8507.
2. Wu Y, Simons PC, Lopez GP, Sklar LA, Buranda T. (2005) Dynamics of fluorescence dequenching of ostrich-quenched fluorescein biotin: a multifunctional quantitative assay for biotin. *Anal Biochem*, 342, 221.
3. Humbert N, Zocchi A, Ward TR. (2005) Electrophoretic behavior of streptavidin complexed to a biotinylated probe: a functional screening assay for biotin-binding proteins. *Electrophoresis*, 26, 47.
4. Balthasar S, Michaelis K, Dinauer N, von Briesen H, Kreuter J, Langer K. (2005) Preparation and characterisation of antibody modified gelatin nanoparticles as drug carrier system for uptake in lymphocytes. *Biomaterials*, 26, 2723.
5. Schiestel T, Brunner H, Tovar GE. (2004) Controlled surface functionalization of silica nanospheres by covalent conjugation reactions and preparation of high density streptavidin nanoparticles. *J Nanosci Nanotechnol*, 4, 504.

6. Huang F, Wang G, Coleman T, Li N. (2003) Synthesis of adenosine derivatives as transcription initiators and preparation of 5' fluorescein- and biotin-labeled RNA through one-step in vitro transcription. *Rna*, 9, 1562.
7. Hoya K, Guterman LR, Miskolczi L, Hopkins LN. (2001) A novel intravascular drug delivery method using endothelial biotinylation and avidin-biotin binding. *Drug Deliv*, 8, 215.
8. Wu MM, Llopis J, Adams S, McCaffery JM, Kulomaa MS, Machen TE, Moore HP, Tsien RY. (2000) Organelle pH studies using targeted avidin and fluorescein-biotin. *Chem Biol*, 7, 197.
9. Kada G, Kaiser K, Falk H, Gruber HJ. (1999) Rapid estimation of avidin and streptavidin by fluorescence quenching or fluorescence polarization. *Biochim Biophys Acta*, 1427, 44.
10. Kada G, Falk H, Gruber HJ. (1999) Accurate measurement of avidin and streptavidin in crude biofluids with a new, optimized biotin-fluorescein conjugate. *Biochim Biophys Acta*, 1427, 33.
11. Adamczyk M, Chen YY, Moore JA, Mattingly PG. (1998) Estradiol-mimetic probes. Preparation of 17 alpha-(6-aminohexynyl)estradiol biotin, fluorescein and acridinium conjugates. *Bioorg Med Chem Lett*, 8, 1281.
12. Adamczyk M, Mattingly PG, Reddy RE. (1998) Synthesis of 6 beta-aminoestradiol and its biotin, acridinium, and fluorescein conjugates. *Steroids*, 63, 130.
13. Li X, James WM, Traganos F, Darzynkiewicz Z. (1995) Application of biotin, digoxigenin or fluorescein conjugated deoxynucleotides to label DNA strand breaks for analysis of cell proliferation and apoptosis using flow cytometry. *Biotech Histochem*, 70, 234.
14. Igloi GL, Schiefermayr E. (1993) Enzymatic addition of fluorescein- or biotin-riboUTP to oligonucleotides results in primers suitable for DNA sequencing and PCR. *Biotechniques*, 15, 486.
15. Hase S. (1992) Conversion of pyridylamino sugar chains to 1-amino-1-deoxy derivatives, intermediates for tagging with fluorescein and biotin. *J Biochem (Tokyo)*, 112, 266.
16. Weijers RN, de Bruijn R, Mulder J, Kruijswijk H. (1990) Improved purification of human lactate dehydrogenase isoenzyme-3 and studies with its fluorescein isothiocyanate and biotin conjugates. *Clin Chem*, 36, 59.

Disclaimer: This product is for research use only and is not intended for therapeutic or diagnostic applications. Please contact our technical service representative for more information.