

Product Data Sheet

Product Name: Biotin-PEG4-alkyne

Cat. No.: GC39532

Chemical Properties

Cas. No. 1458576-00-5

SMILES O=C(NCCOCCOCCOCCOCC#C)CCCC[C@H]1SC[C@@]([C@@]1([H])N2)([H])NC2=O

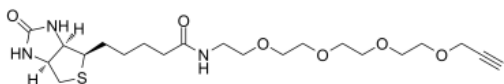
Formula $C_{21}H_{35}N_3O_6S$ M.Wt 457.58

Solubility DMSO: 100 mg/mL (218.54 mM) Storage Store at -20°C

General tips For obtaining a higher solubility, please warm the tube at 37 °C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Shipping Condition Evaluation sample solution : ship with blue ice All other available size: ship with RT, or blue ice upon request.

Structure



Protocol

Biotin-PEG4-alkyne for Labeling Azide-containing Biomolecules via Click Chemistry [1]

This protocol is adapted from research data and provided for reference only. Adjustments may be necessary based on specific experimental requirements.

1. Reagent Preparation: Dissolve Biotin-PEG4-alkyne in high-quality anhydrous DMSO to prepare a 10-50mM stock solution. Aliquot and store protected from light at -20°C, avoiding repeated freeze-

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thaw cycles. Dilute to the working concentration (e.g., 100 μ M) with an appropriate buffer (e.g., PBS) before use. Prepare a 1mM sodium ascorbate solution (freshly prepared before use). Prepare a 1mM CuSO₄ solution. Prepare a click chemistry reaction buffer containing 1mM CuSO₄, 2mM sodium ascorbate, and a ligand (e.g., THPTA or TBTA).

2. Sample Pretreatment: Dissolve the azide-containing protein, peptide, or other biomolecule sample to be labeled in a suitable buffer without primary amines (e.g., Tris, glycine), such as PBS (pH 7.2-7.4). Remove any potential reducing agents (e.g., DTT, β -mercaptoethanol) from the sample via desalting columns or dialysis as needed.

3. Labeling via Click Chemistry Reaction: Under light-protected conditions, sequentially add to the reaction tube containing the azidated biomolecule: the calculated volume of Biotin-PEG4-alkyne working solution (typically at an alkyne-to-azide molar ratio of 1.5:1 to 3:1), and the calculated volume of the click chemistry reaction buffer (ensure final concentrations of approximately 50-100 μ M for CuSO₄ and 100-200 μ M for sodium ascorbate). Gently vortex to mix. Incubate the reaction mixture protected from light with rotation at room temperature (20-25°C) or 4°C for 1-4 hours.

4. Product Purification and Detection: After the reaction, immediately purify the reaction mixture using pre-chilled desalting columns, dialysis, or protein purification methods to remove unreacted Biotin-PEG4-alkyne, copper catalyst, and other small molecules. The purified product can be validated and further analyzed by methods such as Western Blot (using streptavidin-HRP), mass spectrometry, or ELISA.

Precautions:

- (1) This click chemistry reaction is sensitive to oxygen. Prepare the reaction system quickly or consider using deoxygenation equipment.
- (2) Copper catalyst may be toxic or cause aggregation to certain proteins (especially those containing sulfur-containing amino acids). Optimize catalyst concentration, reaction time, or consider copper-free click chemistry strategies.
- (3) Biotin-PEG4-alkyne stock solution must be strictly protected from light and moisture. Aliquot storage is recommended to maintain alkyne activity.
- (4) For your safety and health, please wear a lab coat and disposable gloves during operation.

References:

[1] Dawodu O, White CA, Specht C, et al. Copper-catalysed azide-alkyne cycloaddition on live M13 bacteriophage for expanding the molecular diversity of phage-displayed peptide libraries. RSC Chem Biol. 2025 Aug 14;6(10):1555-1565.

Background

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Biotin-PEG4-alkyne is a functionalized compound that combines biotin, a tetraethylene glycol (PEG4) linker, and a terminal alkyne group. Biotin-PEG4-alkyne can efficiently conjugate with azide groups via click chemistry to form a stable triazole bond, while the PEG4 chain enhances water solubility and biocompatibility to reduce nonspecific binding and steric hindrance. Biotin-PEG4-alkyne can be used in research related to biolabeling, drug delivery systems, and PROTAC molecule construction^[1-4].

References:

- [1] Wang YC, Kelso AA, Karamafrooz A, et al. Arginine shortage induces replication stress and confers genotoxic resistance by inhibiting histone H4 translation and promoting PCNA ubiquitination. *Cell Rep.* 2023 Apr 25;42(4):112296.
- [2] Park J, Wu J, Szkop KJ, et al. SMYD5 methylation of rpL40 links ribosomal output to gastric cancer. *Nature.* 2024 Aug;632(8025):656-663.
- [3] Mravec J, Kračun SK, Zemlyanskaya E, et al. Click chemistry-based tracking reveals putative cell wall-located auxin binding sites in expanding cells. *Sci Rep.* 2017 Nov 22;7(1):15988.
- [4] Dawodu O, White CA, Specht C, et al. Copper-catalysed azide-alkyne cycloaddition on live M13 bacteriophage for expanding the molecular diversity of phage-displayed peptide libraries. *RSC Chem Biol.* 2025 Aug 14;6(10):1555-1565.

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