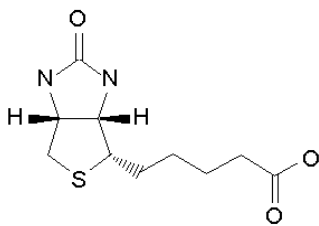
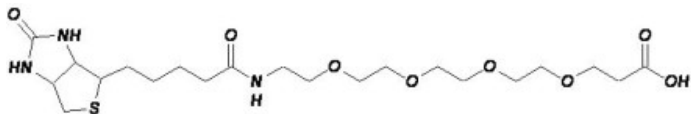
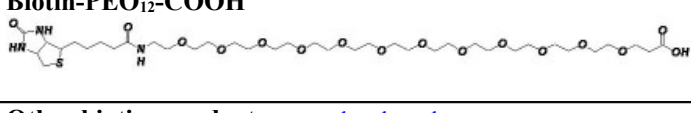


Biotin (carboxylated biotin derivatives)

Products Description

Biotin building blocks (*carboxyl* derivatives)

Carboxylated biotins	MW	spacer length/type	cat.#	
d-Biotin  CAS: [58-85-5]	244.31	-	UP10685A, 200mg UP10685E, 1g UP10685F, 5 g	(L)
Biotin-PEO₄-COOH 	491.6	19.2 Å	BJ007A, 50mg BJ007C, 500mg	(L)
Biotin-PEO₁₂-COOH 	844.02	47.6 Å	CC432A, 50mg CC432B, 500mg	(L)
Other biotins products: see related products (analogues as IminoBiotin, amine derivatives, fluorescent biotins, functionalized reactive biotins, immobilized biotins,...)				

Please inquire for bigger quantities and for bulk needs.

Storage: Store cold, refrigerated (L) or frozen for long term. Keep dry.

Introduction

- **Biotin**, a water-soluble member of the B-complex group of vitamins, is widely used in biotechnologies because of its high affinity for avidin and streptavidin molecules. It serves notably as a marker molecule that is conjugated to specific probes (antibodies, enzymes, peptides...), or a handle for purification purposes.

The isoelectric point of D-Biotin is 3.5. It is a highly polar molecule.

Biotin is also known as vitamin H, vitamin B8 and co-enzyme R. Although there are eight different forms of biotin, only one, D-biotin, occurs naturally and has full vitamin activity. It plays a key role in carbohydrate, fat and protein metabolism. It is relatively stable.

Biotin is found in yeast, liver and kidney, but also in Egg yolk, soybeans, nuts and cereals and in even smaller amounts in other tissues. This may lead to undesired background in detection systems with (strept)avidins and anti biotin reagents.

- Biotin is available as a synthetic compound identical to natural product (UP10685), and also as several derivatives.

For any question,
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FT-10685A

-Biotin derivatives containing a **carboxylic acid** (described in this technical sheet) are used to label various probes (antibodies, enzymes, peptides...) on their amine groups, through reaction with a carbodiimide (EDAC #UP52005). Guide lines for use are proposed below, or see more in tech sheet #[52005A](#).

-**PEO** PolyEthyleneOxy- chain in the spacer (arm spacing biotin from the chemical group for conjugation) confers hydrophilicity to conjugates. This imparts several benefits in biotech applications, such as lower background, better availability of the biotin for its ligand ([strept]avidin), better stability or conformation of the biotin conjugate, lower susceptibility to aggregation, and lower spacer-dependant immunogenicity. Additionally these reagents can usually be pre-dissolved in an organic solvent OR can be directly dissolved in the reaction medium, based on their inherent water solubility. This allow to reach higher coupling concentrations, hence higher coupled ratios. See this technical sheet (for other derivatives: see [UPR2027A](#)).

-Other available derivates of biotins are listed in [related products](#) section, i.e.:

-**2-Iminobiotin**, an analog of biotin, interacts with avidin and streptavidin with high avidity (slightly lower than it's analog biotin #UP10685). Furthermore, the binding is pH-dependent (^{Francis 1997}): at high pH, the free base form of 2-iminobiotin retains the high-affinity ($K_a > 10^{-11} \text{ Mol}^{-1}$) specific binding characteristics of biotin whereas at acidic pH values the salt form of the analog interacts poorly with avidin (^{Athappilly 1997}). The lower affinity at acidic pH allows to break the biotin/avidin bound. Using these properties for an affinity purification you will be able to load your iminobiotinylated molecule to an avidin matrix at pH 9.5 and elute it at pH 4, thus, overcoming the harsh elution conditions associated with biotin. This makes iminobiotin a **label of choice to create reporter molecules dedicated to both detection and separation techniques**. [More information #39375A](#).

.**Aminated** compounds allow conjugation with carboxyl groups or other thought various crosslinkers. See #[84961](#).

.other reactive groups, such as **Succinimidyl ester** (ex [UP52117](#)), **Maleimide** (ex [UP48198A](#)), **Hydrazide** (ex [UP78631A](#)) are useful for easy conjugation of biomolecules in aqueous solutions.

Directions for use

Handling

- Warm to room temperature before opening

Guide lines for organic chemistry *in situ* activation

Carboxylic acid containing biotins are common building blocks in organic chemistry of peptides and nucleic acids.

- Use a 10-20% molar excess of EDC and NHS in dry methylene chloride (dries over 3 Angstrom molecular sieves). Add a methylene chloride solution of the acid to the dry reagents under the dry conditions. Stir for several hours or overnight, then evaporate the solvent and use.

You can also treat reaction mixture with small amount of silica gel to adsorb the excess EDC and the urea byproduct, filter, then evaporate the solvent and use.

Note of Caution - The NHS should be added with the EDC to prevent the formation of the anhydride.

Guide lines for coupling to amines

Carboxylic acid containing biotins can be conjugated in physiological conditions to amine containing molecules (antibodies, aminoalyl nucleotides,...) by reductive amidation. See EDC #UP52005 technical sheet, or refer to the literature, notably in Greg Hermanson Manual.

Greg T. Hermanson, Bioconjugate Techniques, Academic Press, Inc., San Diego, CA, 1996 (ISBN 0-12-342335-X), pp. 377-380.

Alternatively, you may use activated reactive biotins, such as NHS-Biotins (see related products).

Literature d-Biotin UP10685

Cocuzza AJ: A phosphoramidite reagent for automated solid phase synthesis of 5'-biotinylated oligonucleotides; Tetrahedron Lett **30**: 6287-6290 (1989)

Nelson PS, Kent M, and Muthini K: Oligonucleotide labeling methods 3. Direct labeling of oligonucleotides employing a novel, non- nucleosidic, 2-aminobutyl-1,3-propanediol backbone; Nucleic Acid Res **20**: 6253-6259 (1992)

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Related documents and products

See [BioSciences Innovations catalogue](#) and [e-search tool](#).

Desalting tools: [CelluSep](#) Dialysis tubing, Gelfiltration columns

Biotin analogs: IminoBiotin [UP39375](#); NHS-IminoBiotin ([UP35329](#))

Aminated biotins ([84961](#)), for conjugation with carboxyl groups or other through various crosslinkers

Amine reactive biotins (NHS ester derivatives, i.e. [UP52117](#))

Sulphydryl reactive biotins (Maleimide derivatives, i.e. [UP48198A](#))

Hydrazide ([UP78631A](#))

DNA binding biotin: Psoralen-PEO₄-Biotin ([UPL7784](#))

ChromaLinkBiotin ([BT3601](#)), an elegant way to biotinylate and quantify easily the biotinylation ratio

Amine reactive biotins (NHS activated Biotins [UP52117A](#))

Biotin dimers (ex [Q7467A](#)) serve in several detection systems, crosslinks avidin molecules to generate linear avidin oligomers

Fluorescent labeled biotins, tracers for immunoassays and for cell biology

Biotin ethylenediamines (FP-AM544) (useful anterograde and transneuronal tracer)

Immobilized biotins (#39071A), for purification purpose.

Biotinylated antibodies, peptides,...

(strept)avidin reagents (51558A)

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Rev.H08E

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