FT-39375A

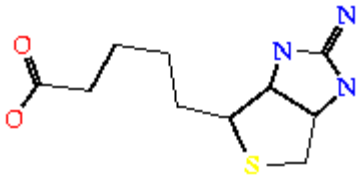
IminoBiotins

Description

IminoBiotin is an analog of d-Biotin that elicits reversible binding with (strept)avidins.

- Biotinylation of biomolecules (proteins, reporter molecules,...) for **both detection and separation techniques**
- Purification with mild conditions (prevents denaturation of purified proteins)
- Pull-down assays (ligand / receptors, enzyme / substrates, DNA/DNA or DNA/protein)

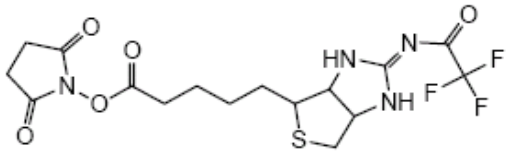
Name: **IminoBiotin** (2-Iminobiotin)
Catalog number: 39375A, 100mg 39375D, 1g
Guanidinobiotin
Hexahydro-2-imino-1H-thieno[3,4-d]imidazole-4-pentanoic acid
Formula : CAS:13395-35-2; **M.W.= 243.3**
Soluble in 0.1N hydrochloric acid.
Store at +4°C(L) 4°C, desiccated(L)



Building block for iminobiotinylations

Name: **NHS-IminoBiotin**
Catalog number: 35329A, 50mg 35329B, 100mg
Formula : N-Hydroxysuccinimidoiminobiotin trifluoroacetamide
CAS:76939-67-8; MW: **436.4**(TFA salt)
Spacer 13.5A
Store at -20°C, desiccated(M)

Reacts with primary amines at pH7-9
to form a stable bond



Catalog number: IU692
Formula : 2-Iminobiotin N-Hydroxysuccinimide
C14H18O5N3S; MW: **340.4** ; CAS:[76939-67-8]

Catalog number: CB052
Formula : 2-Iminobiotin N-Hydroxysuccinimide Ester Hydrobromide
MW: **421.32**

Name: **2-Iminobiotin - Hydrazide**
Catalog number: CB053
Formula : MW: **293.82** ; CAS:[76939-69-0]
Store at -20°C(M)

Technical information

- **2-Iminobiotin** (39375) is an analog of biotin (10685), in which the terminal oxygen atom in the biotin ring structure is replaced with nitrogen. It interacts with avidin and streptavidin with high avidity but the binding can be reversed by competition, unlike it's analog biotin. Furthermore, the binding is pH-dependent ([Francis 1997]): at high pH(>9), the free base form of 2-iminobiotin retains the high-affinity ($Ka>10^{-11}$ Mol^{-1}) specific binding characteristics of biotin whereas at acidic pH(<6) the salt form of the analog interacts poorly with avidin [Athappily 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 required by biotin [Orr 1981]. This makes iminobiotin **a label of choice to create reporter molecules dedicated to reversible detection and separation techniques**.

- The iminoBiotin (39375) can be introduced into oligonucleotides at the 3´-end, 5´-end and internally at any thymidine residue. The reaction involves the use of (with EDC UP52005 (see protocols in technical sheets FT-52005A or FT-10685A). It can also by coupled to proteins and peptides through amines, but a shorter procedure is recommended using:

- **NHS activated iminoBiotin** reagent UP35329 allows direct conjugation to amine containing molecules. See protocols in technical sheets FT-R2027A.

- Finally, conjugation to supports (i.e. agarose) allows biochromatographic purification of avidin containing samples. A method is described for the retrieval of streptavidin can be found in the literature (i.e. from the culture broth of Streptomyces avidinii [Hofmann 1980]).

- 2-Iminobiotin has been reported to to be a **potent, selective reversible inhibitor** of mouse inducible and rat neuronal nitric oxide synthase (iNOS/NOS II; nNOS/NOS I) [Sup 1994, van den Tweel 2005].

References – Labeling and purification

. Hofmann Klaus et al, 1980;77; Proc. Natl. Acad. Sci. 77(8), 4666-4668 ;
Iminobiotin Affinity Columns and Their Application to Retrieval of Streptavidin ; Article
. Athappily F.F. at al, Protein Science (l997), 6:1338-1342 ;
Crystallographic analysis of the pH-dependent binding of iminobiotin by streptavidin; Article
. Heney B and OrrOrr G.A. 1981. Analytical biochemistry, 114(114), undefined (1981-6-1)
The purification of avidin and its derivatives on 2-iminobiotin-6-aminohexyl-Sepharose 4B.
. Orr G.A. 1981.The Journal of biological chemistry, 256(256), undefined (1981-1-25)
The use of the 2-iminobiotin-avidin interaction for the selective retrieval of labeled plasma membrane components.

References – biological activity (celle biology)

. Sup S.J., et al.; BBRC 204, 962 (1994) ; 2-Iminobiotin is an inhibitor of nitric oxide synthases;
. van den Tweel ER , J Cereb Blood Flow Metab. 2005 Jan;25(1):67-74. Long-term neuroprotection with 2-iminobiotin, an inhibitor of neuronal and inducible nitric oxide synthase, after cerebral hypoxia-ischemia in neonatal rats. Abstract.

Related documents and products

• immobilized iminobiotins (39071A)
• other biotins and analogs: Biotin (10685A) and other amine or carboxyl derivatives), PEO-Biotins UPR2027A
d-Desthiobiotin products (FM8442 and functionalized by NHS (1I6291), Hydrazide, Azide, Alkyne, DBCO, Amine,...)
• Biotinylated antibodies, peptides,...
• Desalting tools: CelluSep Dialysis, Gelfiltration columns
See BioSciences Innovations catalogue and e-search tool.

Rev.S06E-P06E-H09E-G08E