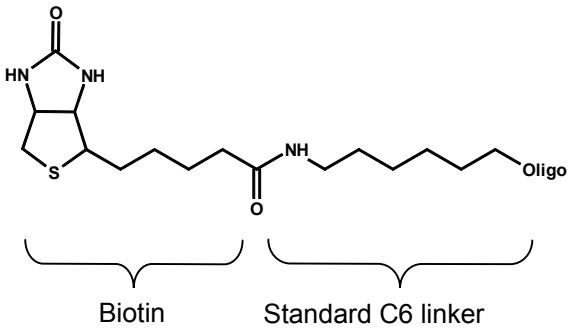
Technical Information
TI-OL11-0805

Biotin Modification

Description

Biotin (or vitamin H) is a small biologically active molecule with a molecular weight of 244,31 Da. It acts as a co-enzyme in living cells. The proteins avidin (from egg white) and streptavidin (from *Streptomyces spec.*) display a very high affinity towards biotin (K_D: 10 - 15 mol/l). Biotin-modified oligonucleotides are widely used in various assays.

Chemical structure:



Advantages

With its highly specific affinity towards avidin and streptavidin, biotin is used in various assays for quality and quantity testing, as well as for purification and separation.
Biotinylated oligonucleotides can be used for specific attachment
- to avidin and streptavidin enzyme-conjugates,
- to avidin and streptavidin protein-conjugates,
- to avidin and streptavidin coated surfaces or
- to avidin and streptavidin dye-conjugates.

Advantages of biotinylated probes are
- high specificity
- high sensitivity – can detect single copy genes
- high stability – can be stored at –20°C for several months without loss of activity
- rapid detection methods with low incubation periods

A disadvantage of analyses with biotin-based assays is the likelihood of obtaining significant background signals due to the presence of natural biotin in living cells. Alternative methods are digoxigenin/antibody assays or enzyme/substrate assays that require labelling the oligonucleotide with digoxigenin or HRP (horseradish peroxidase). Both modifications are also available from Thermo Electron.

Applications

Among the various applications you can find, non-radioactive immunoassays, like fluorescence and chemiluminescence assays, immunohistochemistry or purification and separation of nucleic acids via avidin or streptavidin magnetic beads.

– Attachment to avidin coated surfaces (e.g., Microtiter® plates, ELISA, magnetic beads)
– Non-radioactive immunoassays, such as fluorescence and chemiluminescence assays
– Cytochemical staining, immunohistochemistry
– Fluorescence *in-situ* hybridization (FISH)
– Pyrosequencing™ (Biotage AB)
– Isolation, separation and purification of nucleic acids

Product offering

Biotin can be ordered at the 5'- or 3'- end, as well as internal modification via modified T bases (biotin-dT).

5'-or 3'- biotin modifications are available in all standard scales:

		synthesis scale				
	available	0.02 µmol	0.04 µmol	0.2 µmol	1.0 µmol	10 µmol
Biotin	3'- / 5'-					

Please note: 3'- modified oligonucleotides will not be elongated during PCR.

Internal biotin modifications are available at two scales: 0.2 µmol and 1.0 µmol. If you need higher scales please contact us.

		synthesis scale	
	couplings per order	0.2 µmol	1.0 µmol
Biotin-dT	1		
	2 – 4		
	5 or more		

You can easily order via the web: www.thermo.com/oligos or
email: sales.oligos@thermo.com

Literature

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Ronaghi M *et al.,* (2003) A sequencing method based on real-time pyrophosphate, a review. Science 281, pp 363-365.
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Green NM (1990) Avidin and streptavidin Methods Enzymol.;184: pp 51-67.
Bayer EA. Wilchek M (1980) Methods in Biochemical Analysis, 26: pp1-45.

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