

Thiol Oligonucleotides

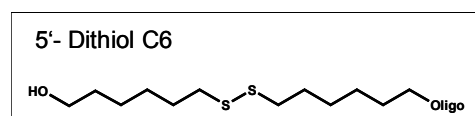
Description

Thiol groups (SH groups) can be used for functionalization of oligonucleotides and are available at the 3'- or 5'- termini. Thiol modifications are used to couple thiol reactive molecules (such as maleimides, halogens or pyridyl disulfides) to oligonucleotides. Thermo Electron thiol oligonucleotides are delivered dried and "ready-to-use" (reduced form, with free SH groups).

Standard available thiol modifiers are:



On request, oligonucleotides with dithiolink are also available:



Application

Thiol functionalized oligonucleotides can be used:

- for coupling of maleimide dyes
- for coupling of peptides, proteins or enzymes via cysteine residues to oligonucleotides
- for immobilization on surfaces (gold, activated glass arrays or magnetic beads)
- for controlled post-labelling of amino-/thiol double-labelled

oligonucleotides with one amine reactive molecule and one thiol reactive molecule

- as precursor molecule for further activation of oligonucleotides (introduction of silyl, aldehyde, hydrazide or pyridyl disulfide groups)
- for cyclisation of 3'- and 5'- thiol oligonucleotides (via S-S linkage at the termini)

Handling and Storage

Free SH groups are highly susceptible to oxidation, thus forming disulfide bonds (S-S). Thus, thiol oligonucleotides should only be reconstituted shortly before usage and have to be stored at -20°C. Once reconstituted, the oxidation process starts. If you encounter reactivity loss due to oxidation (number of free SH groups decreases), you should perform the following reduction procedure:

- dilute your thiol oligo solution with the same volume of phosphate or Tris buffer, pH 8.5
- add solid DTT to a final concentration of 100mM DTT
- after 30 min incubation at room temperature use NAP-10 column to remove excess buffer and DTT

Product offering

Thermo Electron standard thiol oligonucleotides are available “ready-to-use” in the following synthesis scales:

	0.02 μmol	0.04 μmol	0.2 μmol	1.0 μmol	10 μmol
5'-Thiol C6	x	x	x	x	x
3'-Thiol C3	x	x	x	x	x

Please contact sales.biopolymers@thermo.com if you are interested in the 5'-Dithiol C6 modification.

Literature

- Beaucage S.L. *et al.*, (2004) Synthesis of Modified Oligonucleotides and Conjugates. *Current Protocols in Nucleic Acid Chemistry*, Chapter 4
- Bergstrom D.E. *et al.*, (2002) Nucleic Acid based Microarrays and Nanostructures. *Current Protocols in Nucleic Acid Chemistry*, Chapter 12
- Kumar A. *et al.* (2000) Silanized nucleic acids: a general platform for DNA immobilization. *Nucleic Acids Res.* 28: e71
- Goa, H. *et al.*, (1995) Circularization of oligonucleotides by disulfide bridge formation. *Nucleic Acids Res.* 23, pp. 2025-2029

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