



Product Specifications

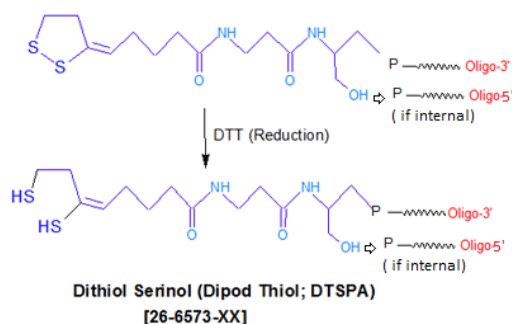
Custom Oligo Synthesis, antisense oligos, RNA oligos, chimeric oligos, Fluorescent dyes, Affinity Ligands, Spacers & Linkers, Duplex Stabilizers, Minor bases, labeled oligos, Molecular Beacons, siRNA, phosphonates Locked Nucleic Acids (LNA); 2'-5' linked Oligos

Oligo Modifications

For research use only. Not for use in diagnostic procedures for clinical purposes.

Thiol SS Dipod (DTSPA)

Category	Others
Modification Code	DTSPA
Reference Catalog Number	26-6573
5 Prime	Y
3 Prime	Y
Internal	Y
Molecular Weight(mw)	412.46



Thiol SS Serinol Dipod DTSPA) is a disulfide-containing modifier designed to functionalize synthetic DNA or RNA with multiple thiol groups and can be incorporated at any position of the oligonucleotide. Each DTPA addition leads to two thiol groups. This modifier was designed for optimal tethering of oligonucleotides to a gold surface but it can also be used for multiple reactions with maleimides and other thiol-specific derivatives.

See Gene Link Manual for Gold Surface Conjugation for details Gold Surface Thiol Conjugation

After synthesis, Gene Link supplies the oligo to the customer in the **oxidized (disulfide)** form. The disulfide bond can then be reduced with TCEP or dithiothreitol (DTT) to generate the fully active thiolated oligo by the customer in his/her own laboratory.

SPECIAL NOTE. Prior to use, reduce any disulfide formation using 100 mM TCEP or DTT for 30 minutes at room temperature. TCEP 0.5M solutions is available from Gene Link, Catalog Number: 40-5116-10. TCEP use is recommended for reduction as conjugation efficiency are 2-3% higher if TCEP is used.

Thiol Reduction Protocol

Thiolated oligonucleotides can be labeled with thiol-reactive dye / happen iodoacetamides or maleimides (for example, lucifer yellow iodoacetamide or fluorescein maleimide) for use as hybridization or PCR-based detection probes (1). They also can be conjugated to enzymes (for example, alkaline phosphatase or horseradish peroxidase), through bifunctional linkers (2). Finally, thiolated oligos can be attached to glass slides or gold surfaces for use in various microarray or nanoelectronic applications (3,4). However, because oligos labeled with only one thiol slowly dissociate from a gold surface at the temperatures (60C to 90C) and high salt concentrations commonly used to denature DNA duplexes (5), Gene Link recommends that researchers who plan to use such conditions to repeatedly strip and re-probe oligo arrays based on thiol-gold surface conjugation modify the oligos with DTPA, which incorporates two thiol groups into the oligo, thereby allowing for a more stable attachment to gold. For further information on DTPA, please see its technical sheet.

References

1. Connolly, B.A., Rider, P. Chemical synthesis of oligonucleotides containing a free sulphhydryl group and subsequent attachment of thiol specific probes. *Nucleic Acids Res.* (1985), **13**: 4485-4502.
2. Ghosh, S.S., Kao, P.M., McCue, A.W., Chappelle, H.L. Use of maleimide-thiol coupling chemistry for efficient syntheses of oligonucleotide-enzyme conjugate hybridization probes. *Bioconjugate Chem.* (1990), **1**: 71-76.
3. Roger, Y-H., Jiang-Baucom, P., Huang, Z-J., Bogdanov, V., Anderson, S., Boyce-Jacino, M.T. Immobilization of oligonucleotides onto a glass support via disulfide bonds: A method for preparation of DNA microarrays. *Anal. Biochem.* (1999), **266**: 23-30.
4. Ackerson, C.J., Sykes, M.T., Kornberg, R.D. Defined DNA/nanoparticle conjugates. *Proc. Natl. Acad. Sci. USA* (2005), **102**: 13383-13385.
5. Li, Z., Jin, R., Mirkin, C.A., Letsinger, R.L. Multiple thiol-anchor capped DNA-gold nanoparticle conjugates *Nucleic Acids Res.* (2002), **30**: 1558-1562.