Product Specifications

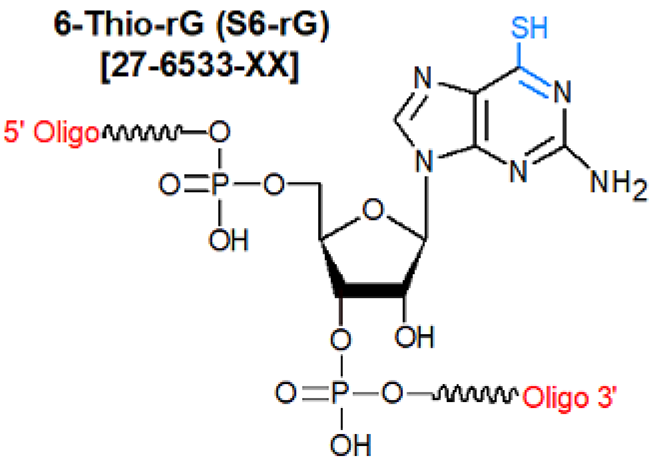
Custom Oligo Synthesis, antisense oligos, RNA oligos, chimeric oligos,
Fluorescent dyes, Affinity Ligands, Spacers & Linkers, Duplex Stabilizers,
Minor bases, labeled oligos, Molecular Beacons, siRNA, phosphonates
Locked Nucleic Acids (LNA); 2′-5′ linked Oligos

Oligo Modifications

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

Thio 6-rG (s6rG)

Category	Structural Studies
Modification Code	S6-rG
Reference Catalog Number	27-6533
5 Prime	Y
3 Prime	Y
Internal	Y
Molecular Weight(mw)	361.26



6-Thio-ribGuanosine (6-Thio-4G; s6rG) and 6-Thio-deoxyGuanosine (6-Thio-dG; s6dG) is a nucleoside that, when incorporated into either DNA or RNA in the cell, exhibits potent cytotoxicity. Such cytotoxicity is most likely due to the 6-Thio-dG either inducing strand breakage or cross-linking to both DNA and proteins (1). The cytotoxic properties of 6-Thio-dG make it an effective cytotoxic agent for treating human leukemias. Its ability to photochemically cross-link to both nucleic acids and proteins also make 6-Thio-dG-modified oligonucleotides desirable reagents for use in studying binding interactions between DNA and DNA-binding proteins. In one study, 6-Thio-dG was shown to efficiently cross-link with EcoRV endonuclease and methyltransferase (2). Cross-linking was achieved with 340 nm UV light; because this wavelength is considerably removed from the UV absorbance maxima of the natural bases (260 nm), cross-linking can be achieved without additional UV damage to the DNA.

6-Thio-ribGuanosine (6-Thio-4G; s6rG) and 6-Thio-deoxyGuanosine (6-Thio-dG; s6dG) can also be used to study the properties of G-rich triple-helix forming oligonucleotides. For example, substitution of 6-Thio-ribGuanosine (6-Thio-4G; s6rG) and 6-Thio-deoxyGuanosine (6-Thio-dG; s6dG) for some or all Gs in such oligos results in inhibition of both oligo self-association and G-quartet formation, thereby favoring normal formation of triple helices (3).

In addition, because the thiol group of 6-Thio-ribGuanosine (6-Thio-4G; s6rG) and 6-Thio-deoxyGuanosine (6-Thio-dG; s6dG) are active, incorporation of this modified nucleoside into an oligo also incorporates a reactive thiol at that position, which can be utilized to selectively alkylate the sulfur at that position (4).

References

1. Christopherson, M.S., Broom, A.D. Synthesis of oligonucleotides containing 2’-deoxy-6-thioguanosine at a predetermined site. *Nucleic Acids Res.* (1991), **19**: 5719-5724.
2. Nikiforov, T.T., Connolly, B.A. Oligodeoxynucleotides containing 4-thiothymidine and 6-thiodeoxyguanosine as affinity labels for the Eco RV restriction endonuclease and modification methylase. *Nucleic Acids Res.* (1992), **20**: 1209-1214.
3. Rao, T.S., Durland, R.H., Seth, D.M., Myrick, M.A., Bodepudi, V., Revankar, G.

R. Incorporation of 2’-Deoxy-6-thioguanosine into G-Rich Oligodeoxyribonucleotides Inhibits G-Tetrad Formation and Facilitates Triplex Formation.*Biochemistry* (1995), **34**: 765-772.
4. Coleman, R.S., Pires, R.M. Covalent cross-linking of duplex DNA using 4-thio-2’-deoxyuridine as a readily modifiable platform for introduction of reactive functionality into oligonucleotides. *Nucleic Acids Res.* (1997), **25**: 4771-4777.