Product Specifications

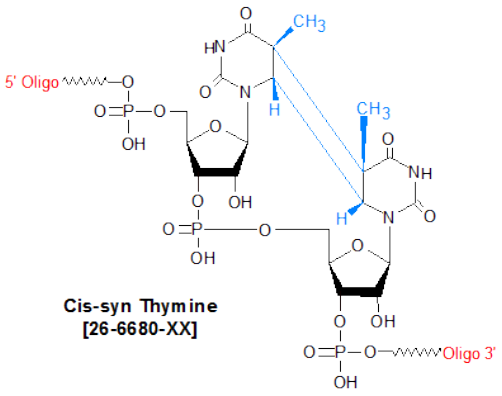
Custom Oligo Synthesis, antisense oligos, RNA oligos, chimeric oligos, Fluorescent dyes, Affinity Ligands, Spacers & Linkers, Duplex Stabilizers, Minor bases, labeled oligos, Molecular Beacons, siRNA, phosphonates Locked Nucleic Acids (LNA); 2′-5′ linked Oligos

Oligo Modifications

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

Thymine Dimer Cis-syn

Category	Others
Modification Code	Cis-TT
Reference Catalog Number	26-6680
5 Prime	Y
3 Prime	Y
Internal	Y
Molecular Weight(mw)	608.39



Cis-syn Thymine
[26-6680-XX]

Cis-syn thymine is classified as a cis-syn Cyclobutane Pyrimidine Dimer (CPD) of two thymine bases, and is primarily used in studies of UV-induced DNA damage and associated repair mechanisms. In the cell, cis-syn thymine dimer DNA lesions are primarily formed when two adjacent thymidine bases are irradiated by UV light (most commonly from sunlight). The result is the generation of a dimer in the form of a cyclobutane (1). This bulky adduct lesion causes large structural distortion in the double helix. While not mutagenic, they act as effective replication blocks; as such, they are potentially lethal to the cell (2). This lesion is repaired via one of two repair DNA repair mechanisms: direct reversal with the enzyme photolyase (which cleaves the dimer) (3) or by the nucleotide excision repair (NER) mechanism (4).
A further mode of oxidative damage is radiation-induced damage of DNA, which has been shown to lead to bridged cyclonucleosides. The purines, cyclo-dA and cyclo-dG, are predominantly formed, although the cyclo pyrimidines have also been detected. Cyclo-dA is doubly intriguing since it contains both damaged base and damaged sugar residues and, as such, should have a considerable biological impact. In a manner analogous to thymine dimer, cyclo purines cause significant distortion of the regular DNA helix and these lesions are repaired not by base excision repair (BER) but by NER.
Oligos synthesized with cis-syn thymine dimer are stable for greater than 6 month when stored frozen, protected from light and preferably in an ethanol precipitated dried state. Reconstituted oligos should be preferably stored frozen in aliquots to avoid multiple freeze thaw cycles.

References

1. Smith, C.A., Taylor, J-S. Preparation and characterization of a set of deoxyoligonucleotide 49-mers containing site-specific cis-syn, trans-syn-I, (6-4), and Dewar photoproducts of thymidylyl(3' to 5')-thymidine. *J. Biol. Chem.* (1993), **268**: 11143-11151.
2. Gentil, A., Le Page, F., Margot, A., Lawrence, C.W., Borden, A., Sarasin, A. Mutagenicity of a unique thymine-thymine dimer or thymine-thymine pyrimidine pyrimidone (6-4) photoproduct in mammalian cells. *Nucleic Acids Res.* (1996), **24**: 1837-1840.
3. Sancar, A. Structure and function of DNA photolyase and cryptochrome blue-light photoreceptors.*Chem. Rev.* (2003), **103**: 2203-2237.
4. de Laat, W.L., Jaspers, N.G.J., Hoeijmakers, J.

H.J. Molecular mechanism of nucleotide excision repair. *Genes & Development.* (1999), **13**: 768-785.