Product Specifications

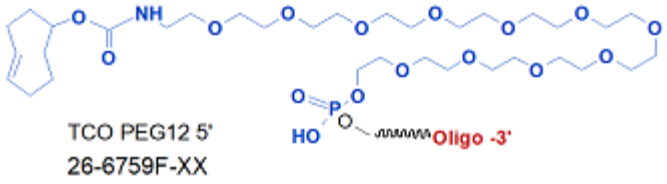
Custom Oligo Synthesis, antisense oligos, RNA oligos, chimeric oligos, Fluorescent dyes, Affinity Ligands, Spacers & Linkers, Duplex Stabilizers, Minor bases, labeled oligos, Molecular Beacons, siRNA, phosphonates Locked Nucleic Acids (LNA); 2′-5′ linked Oligos

Oligo Modifications

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

TCO-PEG12 5'

Category	Click Chemistry
Modification Code	TCO-PEG12-5
Reference Catalog Number	26-6759F
5 Prime	Y
3 Prime	N
Internal	N
Molecular Weight(mw)	752.93



TCO PEG12 5'
26-6759F-XX

Click here for a complete list of Click Chemistry Oligo Modifications

TCO (trans-cyclooctene) PEG12 is for 5' modification to introduce an active TCO group to an oligonucleotide. It includes a long PEG12 spacer between the 5' end of the oligo and the active TCO group.
The TCO (trans-cyclooctene) modification is known for its high internal strain on the double bond, facilitating the Strain-Promoted Inverse Electron-Demand Diels-Alder Reaction (SPIEDAC) with tetrazine derivatives. This is also known as an inverse electron-demand Diels-Alder, (IEDDA) cycloaddition.
A tetrazine (acting as a diene) rapidly reacts with a trans-cyclooctene (TCO, acting as a dienophile) to form a cyclic adduct, followed by a subsequent retro-Diels-Alder reaction that eliminates nitrogen gas, leaving behind a stable conjugated product; essentially, a very fast "click" reaction often used in bioorthogonal chemistry due to its high speed and specificity in aqueous environments This reaction proceeds selectively even in the presence of various functional groups, making it applicable as a click chemistry tool. Click chemistry utilizing TCO does not require metal catalysts and exhibits rapid reaction rates as its primary feature. This click chemistry meets the criteria for bioorthogonal reactions (fast, selective, biocompatible, metal-free) and finds applications in a wide range of uses such as protein labeling and imaging.

References

1. Huisgen, R. *Angew. Chem. Int. Ed.* (1963), **2**: 565-568.
2. Rostovtsev, V.V., Green, L.G., Fokin, V.V., Sharpless, K.B. A Stepwise Huisgen Cycloaddition Process: Copper(I)-Catalyzed Regioselective Ligation of Azides and Terminal Alkynes. *Angew. Chem. Int. Ed.* (2002), **41**: 2596-2599.
3. Kumar, R., El-Sagheer, A., Tumpane, J., Lincoln, P., Wilhelmsson, L.M., Brown, T. Template-Directed Oligonucleotide Strand Ligation, Covalent Intramolecular DNA Circularization and Catenation Using Click Chemistry. *J. Am. Chem. Soc.* (2007), **129**: 6859-6864.