Product Specifications

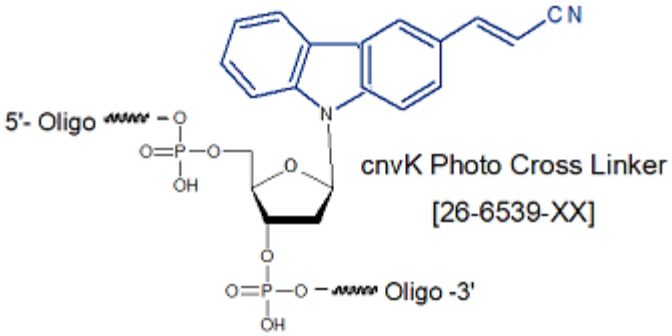
Custom Oligo Synthesis, antisense oligos, RNA oligos, chimeric oligos, Fluorescent dyes, Affinity Ligands, Spacers & Linkers, Duplex Stabilizers, Minor bases, labeled oligos, Molecular Beacons, siRNA, phosphonates Locked Nucleic Acids (LNA); 2′-5′ linked Oligos

Oligo Modifications

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

cnvK Photo Cross Linker

Category	Photo Cleavable
Modification Code	cnvK
Reference Catalog Number	26-6539
5 Prime	Y
3 Prime	Y
Internal	Y
Molecular Weight(mw)	396.33



Nature Methods: Application Note: Light-Seq: light-directed in situ barcoding of biomolecules in fixed cells and tissues for spatially indexed sequencing.
Jocelyn Y. Kishi,, Ninning Liu, Emma R. West, Kuanwei Sheng, Jack J. Jordanides, Matthew Serrata1, Constance L. Cepko, Sinem K. Saka, and Peng Yin.
Nature Methods | VOL 19 | 1394 November 2022 | 1393-1402 | www.nature.com/naturemethods
https://doi.org/10.1038/s41592-022-01604-1

Oligonucleotide incorporated with a 3-cyanovinylcarbazole nucleoside (^{CNV}K) can be induced to undergo rapid photo cross-linking to the complementary strand at one wavelength and rapid reversal of the cross-link is possible at a second wavelength. Neither wavelength has the potential to cause significant DNA damage. Irradiation of a duplex containing a single incorporation of ^{CNV}K at 366nm led to 100% cross-linking to thymine base in 1 second, although complete cross-linking to cytosine takes 25 seconds (1)1 A 30 second irradiation time should cover all situations. In addition, it was demonstrated that the purine bases were unreactive to cross-linking, allowing differentiation between pyrimidines and purines at the target site. The authors also determined the effect of sequence contexts around the ^{CNV}K site and demonstrated that the identity of bases on either side of the cross-linking site has little effect on the reaction. Once cross-linked, the UV melting temperature of the duplex was raised by around 30 degree C relative to the duplex before irradiation. Complete reversal of the cross-link takes place at 312nm in 3 minutes. This facile reversal reaction is, therefore, accomplished with no damage to normal DNA.

In a later publication, a further application of this cross-linking technique was investigated (2); when ^{CNV}K was cross-linked with a dC residue in duplex DNA, heating at 90 degree C for 3.5 hours led to deamination of the cytosine base to form uracil in the complementary strand. Reversal of the cross-link at 312nm led to a DNA strand in which dC had been converted to dU. The authors showed that this transformation is specific for the dC residue opposite the ^{CNV}K and any further adjacent dC residues are unaffected.

Similarly, the authors have shown that ^{CNV}K can be cross-linked to an adjacent RNA strand (3).

Recommended Further Reading

Glen Report 30.21: CNVK and CNVD-Ultrafast Reversible Photo-Crosslinkers for DNA or RNA.

References

(1) Y. Yoshimura, and K. Fujimoto, Org Lett, 2008, 10, 3227-30.
(2) K. Fujimoto, K. Konishi-Hiratsuka, T. Sakamoto, and Y. Yoshimura, ChemBioChem, 2010, 11, 1661-4.
(3) Y. Yoshimura, T. Ohtake, H. Okada, and K. Fujimoto, ChemBioChem, 2009, 10, 1473-6.