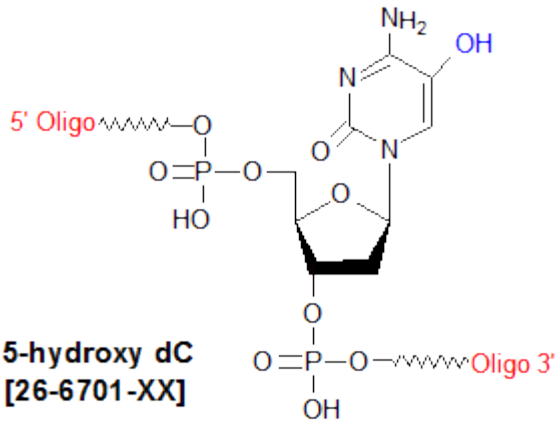
Oligo Modifications

5-OH dC

Category	Epigenetics
Modification Code	5-OH-dC
Reference Catalog Number	26-6701
5 Prime	Y
3 Prime	Y
Internal	Y
Molecular Weight(mw)	305.18



5-hydroxy dC
[26-6701-XX]

5-hydroxy deoxycytosine (5-OH-dC) is classified as an oxidized nucleotide, and is primarily used in studies of oxidative DNA damage and associated repair mechanisms. In the cell, 5-OH-dC DNA lesions are formed by reaction of cytosine with reactive oxygen species (ROS) generated either via normal oxidative metabolic processes or by UV ionizing radiation. 5-OH-dC can potentially mispair with both A and C (leading to C-to-T transitions or C-to-G transversions) (1). 5-OH-dC lesions can deaminate to form a second lesion, 5-hydroxy-deoxyuridine (5-OH-dU). As a single-base lesion, 5-OH-dC is removed by the base excision repair (BER) mechanism and the native cytosine base restored (2). However, the observation of 5-OH-dC in cellular DNA from liver, kidney and brain tissue at levels that remain relatively constant and high over time, suggests that the BER system is not completely effective at removing this lesion, and its presence in DNA may be a significant factor in both tumorigenesis and the aging process (3). **References**

1. Feig, D.I., Sowers, L.C., Loeb, L.A. Reverse chemical mutagenesis: Identification of the mutagenic lesions resulting from reactive oxygen species-mediated damage to DNA. *Proc. Natl. Acad. Sci. USA.* (1994), **91**: 6609-6613.
2. Nilsen, H., Krokan, H.E. Base excision repair in a network of defence and tolerance.*Carcinogenesis* (2001), **22**: 987-998.
3. Wagner, J.R., Hu, C-C., Ames, B.N. Endogenous oxidative damage of deoxycytidine in DNA. *Proc. Natl. Acad. Sci. USA.* (1992), **89**: 3380-3384.