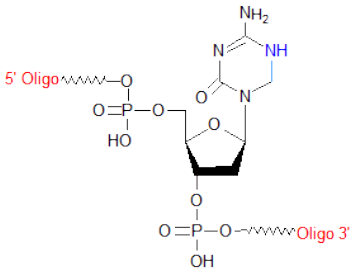
dihydro dC (5-6 DHC)

Category	Minor Bases
Modification Code	5aza 5-6 DHC
Reference Catalog Number	26-6893
5 Prime	Y
3 Prime	Y
Internal	Y
Molecular Weight(mw)	292.18



dihydro dC (5-aza-5-6 DHC)
[26-6893-XX]

This product has been discontinued. See related modifications for alternate modifications. 5-hydroxy dC [5-OH-dC].

5-aza, 5,6-dihydro dC (5,6-DHC) is primarily used to modify oligonucleotides slated for use as tools in cytosine-5-methyltransferase research studies. Cytosine-5-methyltransferases are key enzymes involved in methylation of CpG motifs necessary for epigenetic gene regulation in a wide variety of living organisms (1). Defects in the regulation of this set of enzymes are implicated in cancer (2). The reaction mechanism for these enzymes generates a transient dihydrocytosine as a key intermediate. In an oligo modified with 5-aza, 5,6-dihydro dC, the modification acts as a transition-state mimic, and binds non-covalently to the enzyme's active site with high affinity. As such, it functions as a potent inhibitor of cytosine-5-methyltransferases, which makes them an excellent tool for structural studies, and an attractive alternative to 5-fluoro-cytosine (3). **References**

1. Bestor, T., Laudano, A., Mattaliano, R., et al. Cloning and sequencing of a cDNA encoding DNA methyltransferase of mouse cells. The carboxyl-terminal domain of the mammalian enzymes is related to bacterial restriction methyltransferases. *J. Mol. Biol.* (1997), **270**: 385-395.
2. Beaulieu, N., Morin, S., Chute, I.C., et al. An essential role for DNA methyltransferase DNMT3B in cancer cell survival. *J. Biol. Chem.* (2002), **277**: 28176-28181.
Marquez, V.E., Goddard, A., Alvarez, E., et al. Oligonucleotides containing 5,6-dihydro-5-azacytosine at CpG sites can produce potent inhibition of DNA cytosine-C5-methyltransferase without covalently binding to the enzyme.*Antisense & Nucleic Acid Drug Dev.* (1999), **9**: 415-421.