



## Product Specifications

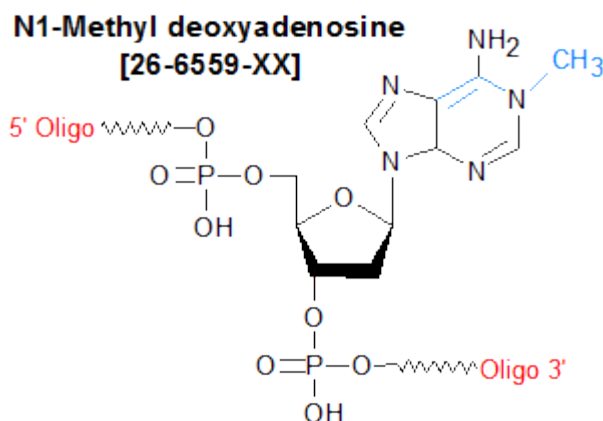
Custom Oligo Synthesis, antisense oligos, RNA oligos, chimeric oligos, Fluorescent dyes, Affinity Ligands, Spacers & Linkers, Duplex Stabilizers, Minor bases, labeled oligos, Molecular Beacons, siRNA, phosphonates Locked Nucleic Acids (LNA); 2'-5' linked Oligos

## Oligo Modifications

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

### N1-Methyl dA (m1dA)

|                          |                    |
|--------------------------|--------------------|
| Category                 | Structural Studies |
| Modification Code        | m1dA               |
| Reference Catalog Number | 26-6559            |
| 5 Prime                  | Y                  |
| 3 Prime                  | Y                  |
| Internal                 | Y                  |
| Molecular Weight(mw)     | 328.24             |



N1-Methyl-deoxyadenosine (N1-Me-dA, m1 dA) is a methylated nucleoside base, and is primarily used in the study of DNA damage and repair mechanisms related to alkylation damage. The N1-Me-dA lesion is primarily generated by SN2 alkylating reagents such as methyl methanesulfonate and dimethylsulfate, which react with the N1 position of adenine (1). In cells, N1-methyl-dA acts as a lethal DNA replication block, but is not very mutagenic (1% A to T transversion in *E. coli*), and is repaired by the enzyme AlkB by direct reversal (2,3). Because the N1 position of adenine is involved in hydrogen bonding of A : T Watson-Crick base pairing, methylation of this site was expected to disrupt hydrogen bonding. However, NMR analysis revealed that N1-methylation actually alters the A:T base-pairing interactions from Watson-Crick to (syn)N1-methyl-A : (anti)T Hoogsteen, thus providing insight into why AlkB repair of N1-Methyl-dA lesions is 10X more efficient on ssDNA over dsDNA (4). **References**

- (1) Sedgwick, B., Lindahl, T. Recent progress on the Ada response for inducible repair of DNA alkylation damage. *Oncogene* (2002), **21**: 8886-8894.
- (2) Chen, B.J., Carroll, P., Samson, I. The Eschericia coli alkB protein protects human cells against alkylation-induced toxicity. *J. Bacteriol.* (1994), **176**: 6255-6261.
- (3) Delaney, J.C., Essigman, J.M. Mutagenesis, genotoxicity and repair of 1-methyladenine, 3-alkylcytosines, 1-methylguanine, and 3-methylthymine in alkB Escherichia coli. *Proc. Natl. Acad. Sci. (USA)* (2004), **101**: 14051-14056.
- (4) Yang, H., Zhan, Y., Fenn, D., Chi, L.M., Lam, S.K. Effect of 1-methyladenine on double-helical DNA structures. *FEBS Letters* (2008), **582**: 1629-1633.