## Bringing you the Sixth Base


# Hydroxymethyl **dCTP**

### Features

- **Ultra-high purity >99% triphosphate by HPLC**
- **Readily incorporated by standard DNA polymerases**
- **Hydroxymethylated substrates can be ligated by standard ligases**
- **DNase, RNase and Nickase free**

### Applications

- **A powerful new tool for DNA methylation and epigenetics research**
- **Studies of hydroxymethylated DNA/protein interaction**
- **Site-Directed Mutagenesis**
- **Substitution of dCTP in a wide variety of molecular biology assays**
- **Labeling of DNA *in vitro***

5-hmC (5-Hydroxymethylcytosine) is the hydroxylated and methylated version of cytosine described as the “sixth base” of the genome.

Bioline has developed a novel enzymatic synthesis method for producing highly purified Hydroxymethyl dCTP (HMdCTP) that mimics its biological synthesis in T-even bacteriophages. This powerful new tool opens up multiple avenues of investigation for DNA methylation and epigenetics research. Highly purified HMdCTP (>99% pure by HPLC, Fig.1) can be used in a number of molecular biological applications.

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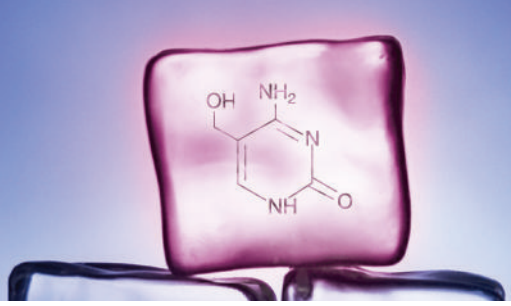
# Hydroxymethyl **dCTP**

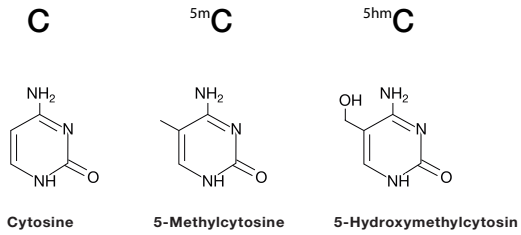


HMdCTP can be used as a substrate for PCR amplification of DNA containing hydroxymethylated cytosine in place of cytosine. HMdCTP can be used to discriminate between the different DNA molecules synthesized in one or several PCR cycles. By the use of appropriate enzymes, it is possible to separate the unhydroxymethylated starting material from the hemi-hydroxymethylated intermediate (produced by a single primer extension reaction) and from the fully-hydroxymethylated end product.

This ability to generate PCR products whereby cytosine is uniformly replaced by hydroxymethylated cytosine can also be applied to: epigenetic/methylation assays, studies of hydroxymethylated DNA/protein interaction, and forensic DNA analysis. Further applications include developing novel strategies for site-directed mutagenesis and synthesizing DNA fragments resistant to cleavage by a wide range of restriction endonucleases as well as generation of cDNA libraries.

For more information regarding Bioline's Bulk, Custom and OEM nucleotide service please visit our dedicated microsite.

| Physical constants, spectral and HPLC analysis | |
|---|---|
| **Product** | **HMdCTP Lithium 100mM Solution** |
| Nomenclature | 5 hydroxymethyl 2´-deoxycytidine-5´-triphosphate |
| Formula | $C_{11}H_{14}N_3O_{14}P_3Li_4$ |
| Molecular Weight | 520.918g/mol |
| λmax pH 7.0 | 275nm |
| ε at λmax | 7.7 E x $mmol^{-1}$ x $cm^{-1}$ |
| Concentration | 100mM±2% |
| Appearance | Clear Colorless Solution |
| pH of Solution | 7.5 |
| dNTP (HPLC Area) | >99% |
| dNDP (HPLC Area) | <1% |
| DNases, RNases, Nicking Activity | Negative |
| Storage | at –20°C |
| Stability | >24 months |
| $A_{250}/A_{260}$ | 0.90±0.03 |
| $A_{250}/A_{260}$ | 1.33±0.03 |
| Storage | at –20°C |
| Stability | >24 months |



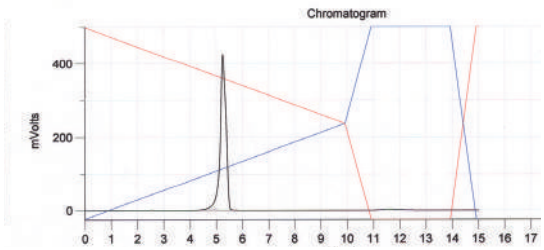




**Fig. 1 HPLC Profile of >99% pure HMdCTP (Hydroxymethylcytosine)**

**Product Citations**


1. Guo, J.U., *et al. Cell* **145(3)**, 423-434 (2011).
2. Stroud, H., *et al. Genome Biol.* **12(6)**, R54 (2011).
3. Kinney, S.M., *et al. J. Biol. Chem.* **286**, 24685-24693 (2011).
4. Robertson, A.B., *et al. Nucleic Acids Res.* **39**, e55 (2011).
5. Szwagierczak, A., *et al. Nucleic Acids Res.* **39(12)**, 5149-5156 (2011).
6. Huang, Y., *et al. PLoS ONE* **5(1)**, e8888 (2010).
7. Jin, S-G., *et al. Nucleic Acids Res.* **38**, e125 (2010).
8. Szwagierczak, A., *et al. Nucleic Acids Res.* **38(19)**, e181 (2010).
9. Nestor, C., *et al. Biotechniques* **48**, 317-319 (2010).
10. Tahiliani, M., *et al. Science* **324**, 930-935 (2009).


## Ordering Information

| PRODUCT | PACK SIZE | PRESENTATION | CAT NO. |
|---|---|---|---|
| dATP | 25µmol | 100mM (1 x 250µl) | BIO-39036 |
| dCTP | 25µmol | 100mM (1 x 250µl) | BIO-39038 |
| dGTP | 25µmol | 100mM (1 x 250µl) | BIO-39037 |
| dTTP | 25µmol | 100mM (1 x 250µl) | BIO-39039 |
| dUTP | 25µmol | 100mM (1 x 250µl) | BIO-39035 |
| HMdCTP | 25µmol | 100mM (1 x 250µl) | BIO-39046 |

PSGBL0312V1.0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