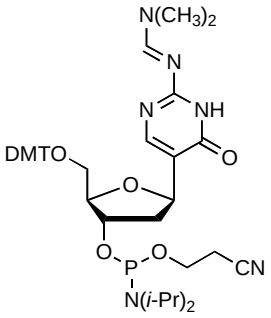
2'-Deoxypseudoisocytidine CEP
(ψ-iso-dC CEP, pidC CEP)
Product No. BA 0236
Product Information



$C_{42}H_{53}N_6O_7P$
Mol. Wt. 784.88

2'-Deoxypseudoisocytidine CEP is an isostere of dC that offers an additional hydrogen-bond donor at N^3.

Introduction: The C-nucleoside 2'-deoxypseudoisocytidine (ψ-iso-dC or pidC CEP) is an isostere of dC that offers an additional hydrogen-bond donor at N^3. Interest in the incorporation of ψ-iso-dC and related compounds into oligonucleotides has grown due to their success in improving triplex formation between oligonucleotides and duplex DNA.[1-3] The C • GC pyrimidine-purine-pyrimidine binding motif requires acidic conditions in order to protonate N^3 of cytosine in the Hoogsteen strand (i.e., C^+ • GC, Figure 1). Unfortunately, this interaction is disrupted under the higher pH of physiological conditions. Improvements have been observed using 5-methyl-2'-deoxycytidine in place of dC, although protonation of N^3 is still required.[4] Kan and co-workers[1-3] have examined the use of 2'-deoxypseudoisocytidine and 2'-*O*-methylpseudoisocytidine as neutral replacements for protonated cytidine (ψ-iso-dC • GC, Figure 1). Indeed, oligonucleotides containing these cytidine replacements form improved triplexes under neutral conditions.

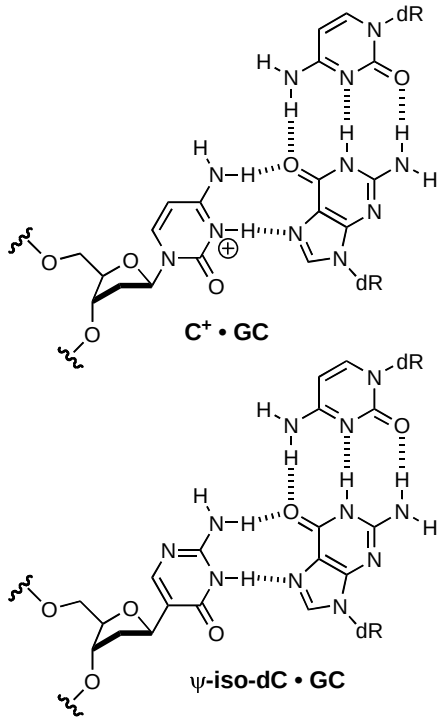


Figure 1. Comparison of pyrimidine-purine-pyrimidine binding motifs for triplex formation involving cationic 2'-deoxycytidine (C^+) and neutral 2'-deoxypseudoisocytidine (ψ-iso-dC) nucleotides.

We offer 2'-Deoxypseudoisocytidine CEP[3,5] for incorporation of ψ-iso-dC into oligonucleotides, allowing researchers to explore the alternate hydrogen-bonding motif afforded by this interesting dC surrogate. For those interested in nucleosides, we also offer pseudoisocytidine hydrochloride (PYA 11060) and 2'-deoxypseudoisocytidine (PYA 11005).

Coupling, deprotection, and purification:

Standard protocols for nucleic acid synthesis were used with the exception of an extended coupling time of 15 min and the use of 0.25 M 5-ethylthio-1*H*-tetrazole (ETT) as the activator, rather than 1*H*-tetrazole, the use of which was not attempted. Cleavage from the controlled-pore glass solid support was carried out with concentrated aqueous ammonium hydroxide at rt as per normal protocols. Nucleobase deprotection was carried out by letting the resultant ammonium hydroxide solution stand at rt for 24 h. In our hands, heating at 55 °C overnight caused some degradation. Please consult reference 3 for information on the purification and use of 2'-deoxypseudoisocytidine-containing oligonucleotides.

References

1. Ono, A.; Ts'o, P. O. P.; Kan, L. *J. Org. Chem*. **1992**, *57*, 3225-3230.
2. Ono, A.; Ts'o, P. O. P.; Kan, L. *J. Am. Chem. Soc*. **1991**, *113*, 4032-4033.
3. Chin, T.-M.; Lin, S.-B.; Lee, S.-Y.; Chang, M.-L.; Cheng, A. Y.-Y.; Chang, F.-C.; Pasternack, L.; Huang, D.-H.; Kan, L.-S. *Biochemistry* **2000**, *39*, 12457-12464.
4. Singleton, D. F.; Dervan, P. B. *Biochemistry* **1992**, *31*, 10995-11003.
5. For an alternate phosphoramidite for ψ-iso-dC incorporation, see: Mayer, A.; Leumann, C. J. *Nucleosides, Nucleotides & Nucleic Acids* **2003**, *22*, 1919-1925.