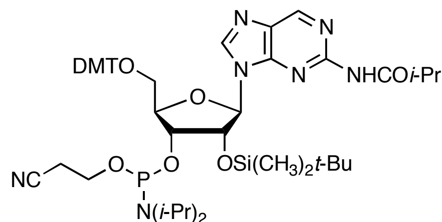
2-Aminopurine Riboside CEP (BA 0266)

Product Information



Deletion of the O^6 carbonyl group of guanosine results in 2-aminopurine riboside (2-AP). The hydrogen bonding pattern of the 2-aminopurine nucleobase (N^1 acceptor, H-N^2 donor) is isomeric with that of adenosine (N^1 acceptor, H-N^6 donor). This nucleoside allows the study of the role of exocyclic functional groups, base stacking, and hydrogen bonding patterns in purine-containing nucleic acids. For example, replacement of guanosine residues with 2-AP in the core region of hammerhead ribozymes was useful in determining their role in stabilizing the transition state of ribozyme cleavage.[1] The nature of hydrogen-bonding between G-A mismatches in RNA internal loops was studied with 2-AP.[2] The role of hydrogen-bonding and stacking interactions in the stability of GNRA loops was probed using 2-AP substitutions.[3] The thermodynamic parameters for RNA loops of the type $(A)_n$ were determined using time-resolved spectrofluorimetry on RNAs bearing 2-AP residues in place of A residues, since 2-AP is blue fluorescent and was found to have properties in the $(A)_n$ region that were otherwise very similar to adenosine.[4] In this sense, 2-AP can be used as a non-invasive conformational probe in RNA studies.

Of the different phosphoramidites that have been used for 2-aminopurine riboside incorporation into RNA oligonucleotides,[1-5] we have chosen to offer 2-Aminopurine Riboside CEP in the particular form shown,[1,4] which appears to offer the best results in RNA synthesis yield and purity.

Coupling, cleavage, and nucleobase deprotection: Please consult references 1 and 4 for the use of this phosphoramidite. Standard coupling methods were used. Tuschl, *et al.*,[1] reported the use of 3:1 concentrated ammonium hydroxide:ethanol for 16 h at 55 °C. Zagorowska and Adamiak[4] reported that cleavage and nucleobase deprotection was accomplished with 3:1 concentrated ammonium hydroxide/ethanol for 2 h followed by 17 h at 55 °C. Desilylation was performed with 1 M tetrabutylammonium fluoride by standard methods. In our hands, a standard coupling time (12 min on an Expedite 8909 instrument) gave highly efficient coupling; extended coupling was not required.

References:

(1) Tuschl, T.; Ng, M. M. P.; Pieken, W.; Benseler, F.; Eckstein, F. *Biochemistry* **1993**, *32*, 11658-11668.
(2) SantaLucia, J., Jr.; Kierzek, R.; Turner, D. H. *J. Am. Chem. Soc*. **1991**, *113*, 4313-4322.
(3) Wörner, K.; Strube, T.; Engels, J. W. *Helv. Chim. Acta* **1999**, *82*, 2094-2104.
(4) Zagorowska, I.; Adamiak, R. W. *Biochemie* **1996**, *78*, 123-130.
(5) Doudna, J. A.; Szostak, J. W.; Rich, A.; Usman, N. *J. Org. Chem.* **1990**, *55*, 5547-5549.