



Product Specifications

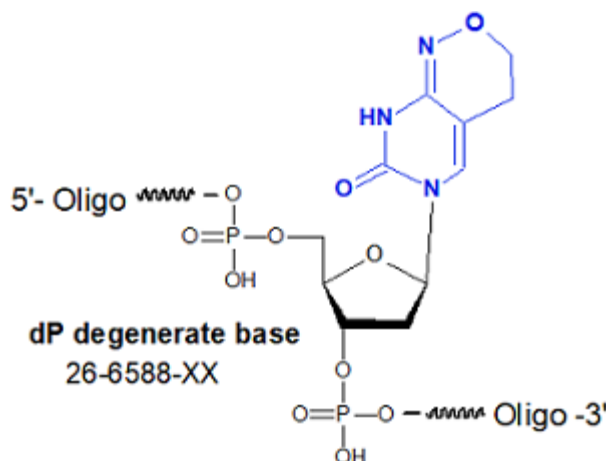
Custom Oligo Synthesis, antisense oligos, RNA oligos, chimeric oligos, Fluorescent dyes, Affinity Ligands, Spacers & Linkers, Duplex Stabilizers, Minor bases, labeled oligos, Molecular Beacons, siRNA, phosphonates Locked Nucleic Acids (LNA); 2'-5' linked Oligos

Oligo Modifications

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

dP degenerate base

Category	Duplex Stability
Modification Code	dP
Reference Catalog Number	26-6588
5 Prime	Y
3 Prime	Y
Internal	Y
Molecular Weight(mw)	330.23



Click here for a complete list of Degenerate Bases & Spiking Oligo Modifications

The degeneracy of the genetic code complicates the design of primers in the absence of unique sequence information. Classically inosine has been used at degenerate position as it is able to base pair with all four bases (1) and function as a universal base. Similarly 5-nitroindole was determined to be an effective universal base (2). The modified bases designated P and K show considerable promise as degenerate bases. The pyrimidine derivative P, when introduced into oligonucleotides, base pairs with either A or G, while the purine derivative K base pairs with either C or T. A dP+dK mix also can serve as a mixed base with much less degeneracy than dA+dC+dG+dT (N) (3, 4).

The degenerate bases P and K are copied as either pyrimidine (C or T) or either purine (A or G), respectively. They can be used together in oligos to prime DNA synthesis in PCR and in sequencing reactions. In a direct comparison, they were more effective in primers than dI.

Fully degenerate sites may be formed in an oligonucleotide using an A/C/G/T mix but the complexity of the mixture of oligonucleotides formed in this way obviously rises with each insertion and limits the usefulness of this technique. The pyrimidine derivative P, when introduced into oligonucleotides, base pairs with either A or G, while the purine derivative K base pairs with either C or T. Oligonucleotides containing one or more P substitutions were found to form duplexes of stability equivalent to the parent sequence and exhibited sharp transitions on melting. Substitution with one or more K residues led to duplexes of reduced but still effective stability (3, 4).

Recommended Further Reading

Glen Report 8.1: New Universal and Degenerate Bases.

Glen Report 9.1: Properties of Oligonucleotides Containing the Bases P and K. **References:**

1. Liu, H. and Nichols, R. PCR amplification using deoxyinosine to replace entire codon and at ambiguous positions. *Biotechniques*. (1994), **16**: 24-26.
2. Loakes, D. and Brown, D.M. 5-Nitroindole as a universal base analogue. *Nucleic Acids Res.*

(1994), 22: 4039-4043.

3. Lin, P.K. and Brown, D.M. Synthesis and duplex stability of oligonucleotides containing cytosine-thymine analogues. Nucleic Acids Res. 1989 Dec 25;17(24):10373-10383

4. Lin, P.K. and Brown, D.M. Synthesis of oligodeoxyribonucleotides containing degenerate bases and their use as primers in the polymerase chain reaction. Nucleic Acids Res., (1992) 20: 5149-5152.