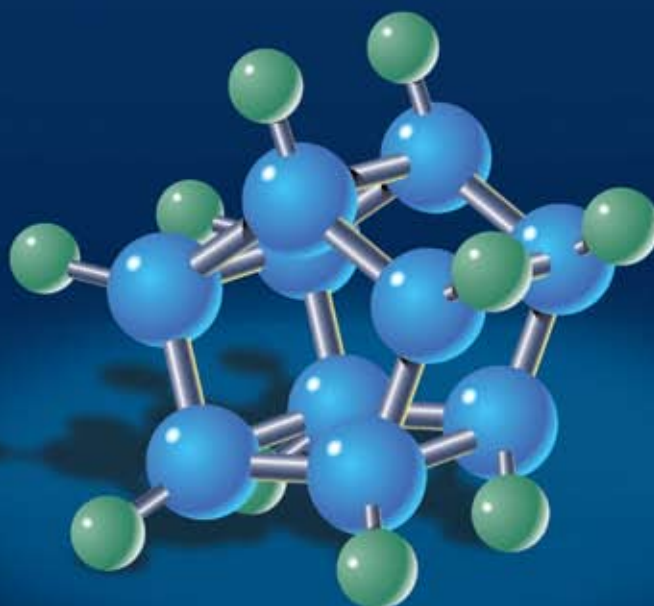


2008, Vol. 2.0



 **ChemGenes**
CORPORATION

Experience Nucleic Acid Expertise



ChemGenes has been in business for over 25 years and has recently moved into a state of the art facility in Wilmington, MA. ChemGenes has a full scale modernized lab with the facilities to manufacture in bulk while maintaining its high quality. We have added many new products to our original line to facilitate research in the area of biotechnology.

As the market for oligonucleotides continues to grow, ChemGenes remains committed to introducing novel products, while maintaining its existing product mix. We also have the capacity to custom synthesize products on request.

Our quality is guaranteed! We want to assure you that every product is of the highest purity and conforms to the technical data sheet that accompanies it when shipped.

- ChemGenes takes pride in a long history of customer satisfaction in supplying phosphoramidites that have a purity of 98% or better for most phosphoramidites.
- Each lot of Phosphoramidite must pass an established testing criteria before it can be shipped to customers.

Required QC Tests for Most Phosphoramidites

Solubility test

- Amidites completely dissolve in Acetonitrile to make a 0.1M Solution (water<0.004-0.005gm/100ml). Leave no visible particulate matter.

Coupling Efficiency

- The coupling efficiency of ChemGenes phosphoramidite products are 98% or better.

HPLC

- Greater than 98.5% purity by HPLC.

³¹P NMR

- Doublet peak or single peak.
- Position of each peak is known for each phosphoramidite.
- The value between the peaks is calculated and recorded.

UV – The UV test provides 4 values of data:

- The ratio between 250/260 nm.
- The ratio between 260/280 nm.
- Emax position.
- Extinction Coefficient.

MASS Spectrum

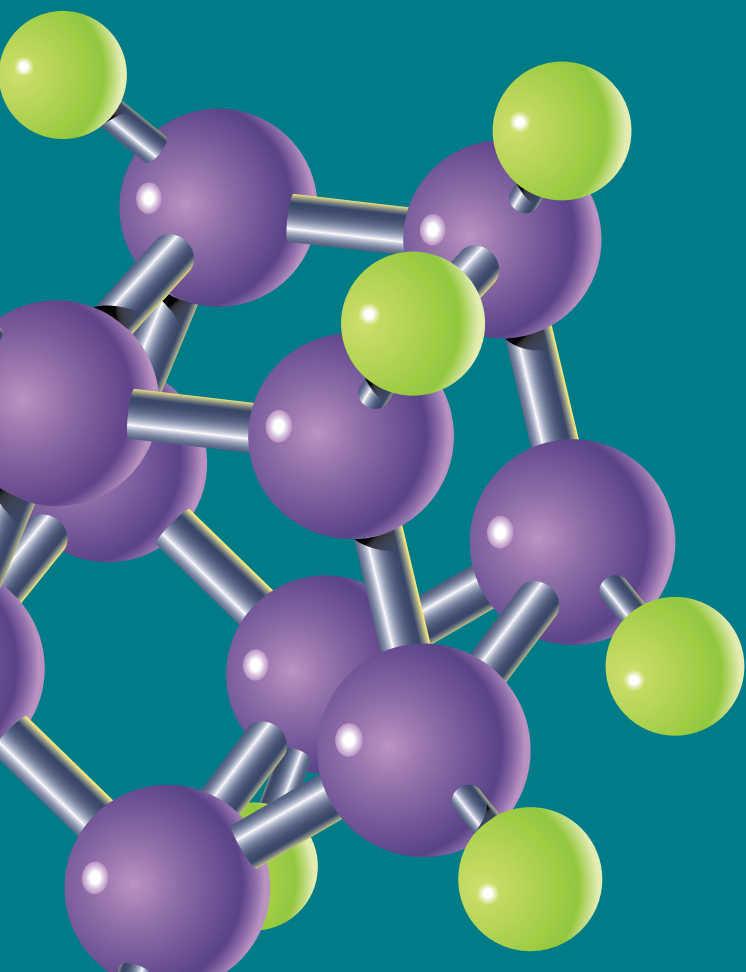
- Performed on each product in +ve and -ve mode.

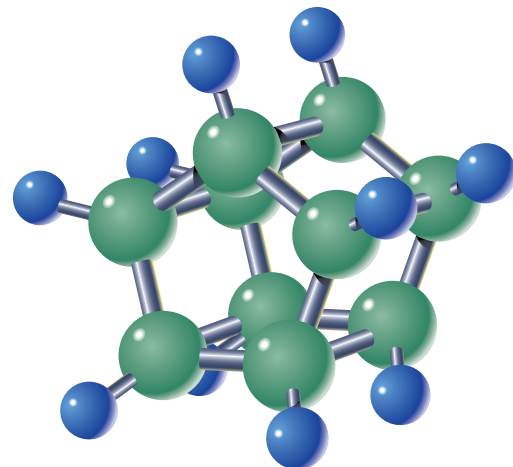
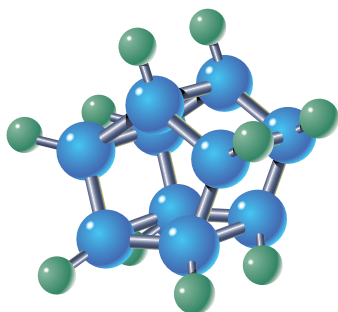
¹H NMR

- Proton NMR analysis is performed for each product.

TLC

- Single or double spot with no other visible impurity on spotting, 0.2mg/spot.
- Single spot or double spot depends on the phosphoramidite.





Our Products

Oligo Synthesis Reagents

Natural DNA Amidites & Supports

Ancillary Reagents

Modified DNA Amidites & Supports

Natural RNA Amidites & Supports

Amidites and Supports for Introducing Chromophores
& Ligands

Amidites and Supports for 2'-O-Methyl
Oligonucleotides

Drying Traps

Oligonucleotide Purification

Nucleosides, Sugars, Purines, & NHS Esters

Unprotected mononucleosides

N-protected mononucleosides

DMT-protected mononucleosides

Phosphoramidite Chemistry Reagents

Sugars & Purines

NHS-Esters

Triphosphates

Modified Triphosphates

Custom Synthesis

New Featured Products

Universal Support

TOM Amidites

8-Methyl ribo Guanosine Amidite

8-Methyl deoxy Guanosine Amidite

Reverse RNA Synthesis

5'-O-Methyl DNA Amidite

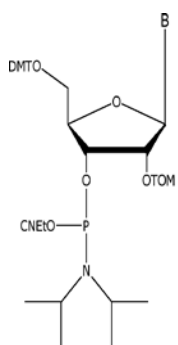
TOM Phosphoramidites

Key Advantages:

- **Superior Quality RNA** using 2'-O-TOM protection: No possibility of 2'-5'-linkage
- Perfected manufacturing process: **prices comparable to TBDMS**
- **Higher Coupling Efficiency** due to lower steric hindrance: Reduced Coupling Time (2-4 minutes)
- **No base modification or M + 30 observed** (through extensive chemical ionization mass analysis)
- **High Quality Long Chain Oligos**

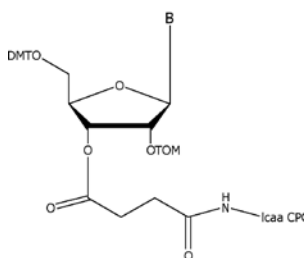
Quality Guaranteed:

- Purity greater than 97% by HPLC.
- 31 P NMR purity ranges from 98 -100%
- UV Spectral data to conform to highest
- 1 H NMR data to conform
- Coupling efficiency greater than 98% per step
- Ideal for Long Chain Oligos
- TOM Amidites Produced under GMP guidelines



Amidites

B	Protection	Catalog #
A	n-acetyl	ANP-3201
C	n-acetyl	ANP-3202
G	n-acetyl	ANP-3203
U	n/a	ANP-3205



Supports

B	Protection	Catalog #	Pore Size
A	n-acetyl	N-32001-05	500A
		N-32001-10	100AA
C	n-acetyl	N-32002-05	500A
		N-32002-10	1000A
G	n-acetyl	N-32003-05	500A
		N-32002-10	1000A
U	n/a	N-32005-05	500A
		N-32005-10	1000A

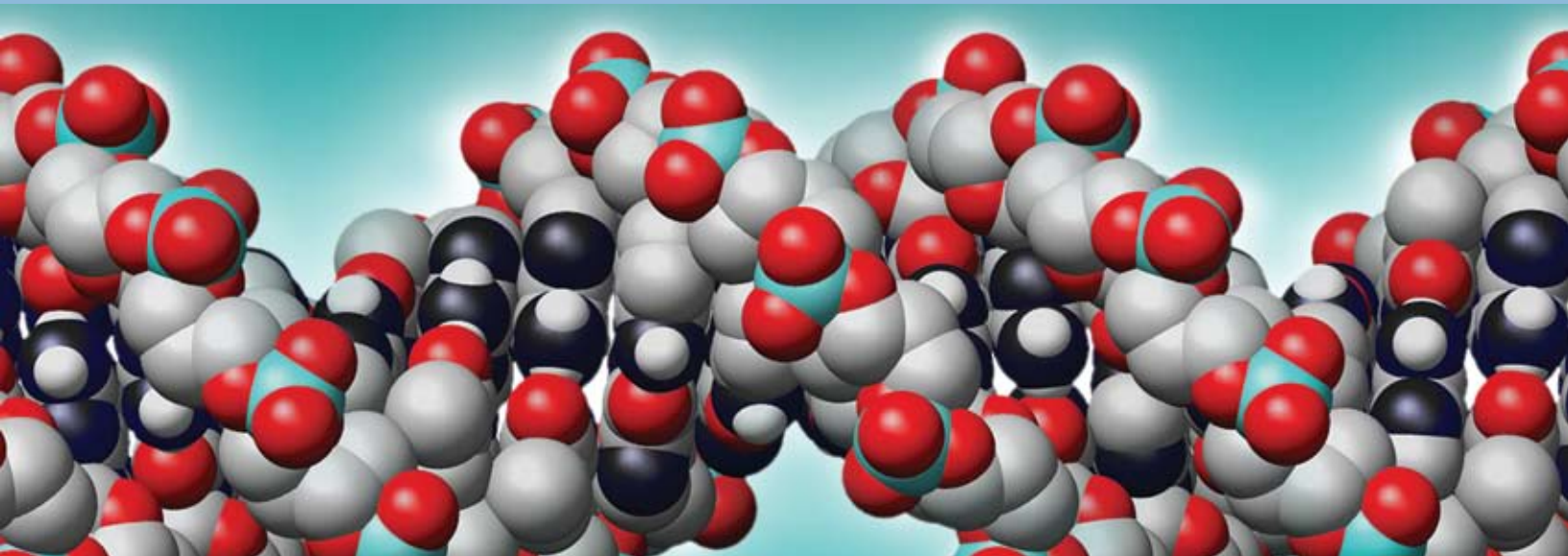
Also Available:

Low to high loading CPG supports with TOM-monomer for uniform deprotection of RNA's.

Now Available Bulk Quantities Manufactured Under GMP Guidelines

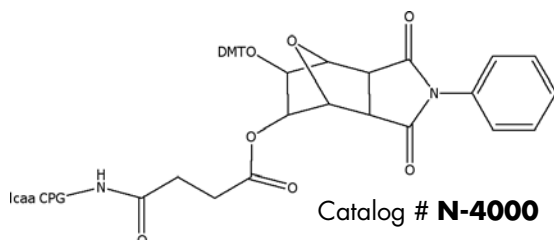
Licensed from QIAGEN Inc. for therapeutic RNA market)

Universal and Non-Cleavable Supports



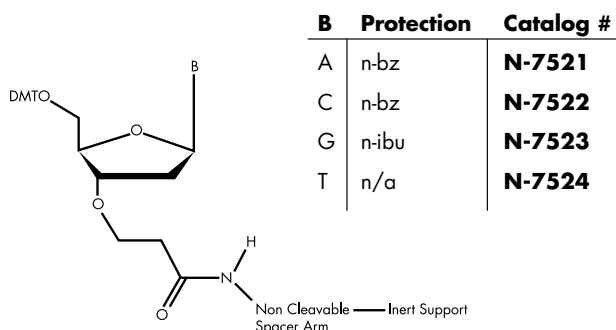
UnyLinker Universal Support for Synthesis of Oligonucleotides:

- Technology Licensed from Isis Pharmaceuticals
- CPG and Polystyrene supports
- Bulk supports and pre-packed columns Available



Non Cleavable Supports & Columns:

- Non-Cleavable inert Supports & Columns
- Uniform Particle Size
- Long Chain Spacer on Rigid non-swelling Support
- Two particle sizes are available; 15-20 μm & 60-70 μm



Key Features:

- Fully compatible with standard phosphoramidite reagents and synthesis conditions
- Has standard DMT group and requires standard deblock solutions for oligonucleotides synthesis
- Coupling efficiency greater than or equal to 99%
- Results in clean oligonucleotides
- Clean and standard succinate linkage and quantitative cleavage from support with ammonium incubation.

Applications:

- High Coupling efficiency leads to pure oligos
- Combinatorial library screening
- High purity Long chain oligos (up to 55-mer synthesized)
- PCR amplification of bead bound oligo is done efficiently

One Bead One Aptamer Combinatorial Library Screening

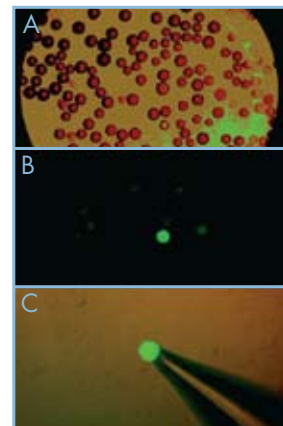
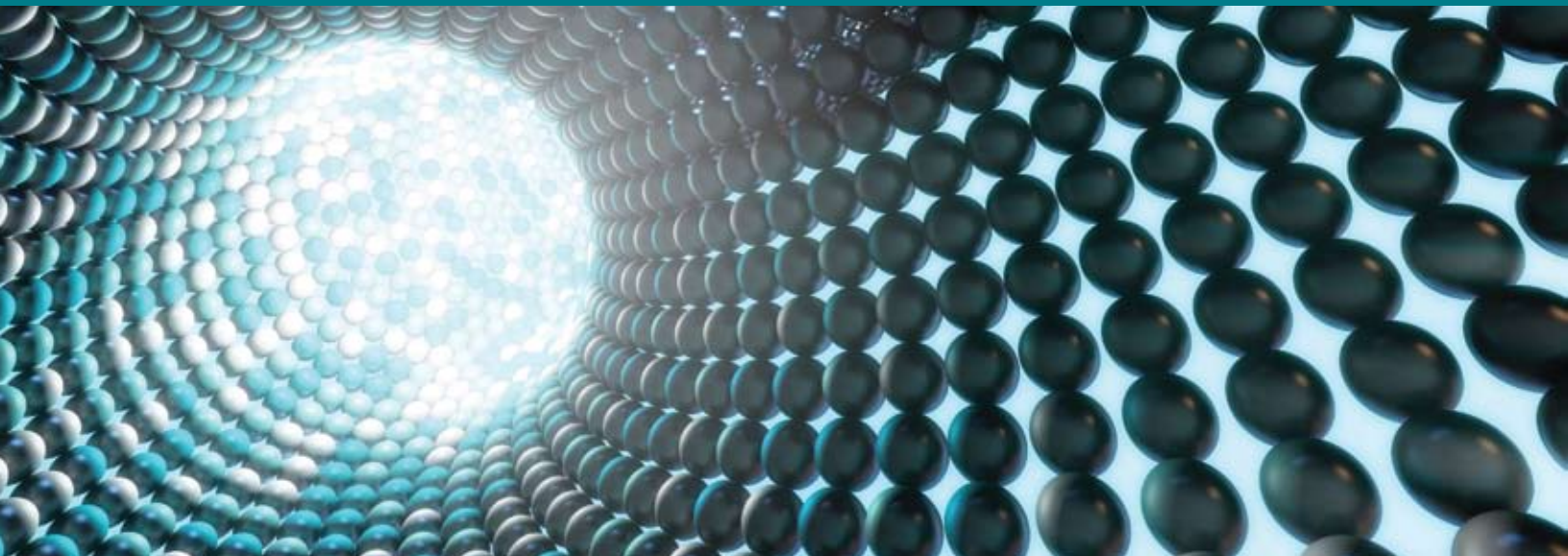


Photo taken by permission from Nucleic Acids Research

Xianbin Yang, Suzanne E. Bassett, Xin Li, Bruce A. Luxon, Norbert K. Herzog, Robert E. Shope, Judy Aronson, Tari W. Prow, James F. Leary, Romy Kirby, Andrew D. Ellington, and David G. Gorenstein, *Nucleic Acid Research*, 2002, vol 30, e 132

For a complete product listing, visit us at www.chemgenes.com

7-Deaza Products



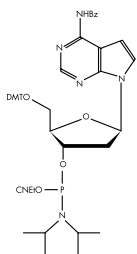
7- Deaza- Purine-Phosphoramidites:

7- Deaza-modification finds extensive application in molecular biology & design of oligos with 7- deaza-substitution, in place of multiple G's in the sequence.

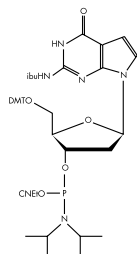
Key Features:

- To avoid extensive secondary structure formation in oligos and thereby improve targeted hybridization more effectively.
- Antiparallel triple helix formation with double stranded DNA is favored with this modification.

7- Deaza-2'-deoxy A & G Phosphoramidites

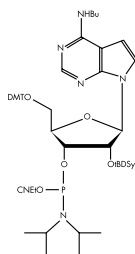


7-Deaza deoxy
Adenosine CED OP
Catalog #: **ANP-4815**

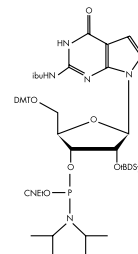


7-Deaza deoxy Guanosine
CED OP
Catalog #: **ANP-4857**

7- Deaza-ribo A & G Phosphoramidites:



7-Deaza Adenosine
CED OP
Catalog #: **ANP-7101**

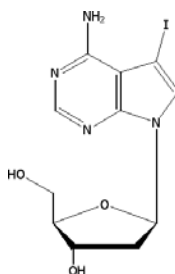


7-Deaza Guanosine
CED OP
Catalog #: **ANP-7301**

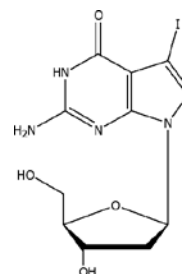
7- Deaza-7-iodo-dA and dG Nucleosides:

Key Modifications:

- For conversion of 7-deaza-7-iodo to C-7-Modified-7-deaza-dA and dG-Modified nucleoside Triphosphates
- Extensive application in molecular biology for diagnostics and sequencing.
- 7- position modifications do not interfere in either PCR or oligo hybridizations.
- The 7- deaza-nucleoside phosphates and triphosphates are currently used in DNA sequencing.



7-Deaza-7-iodo deoxy
Adenosine
Catalog #: **DN-2561**



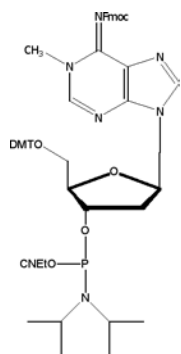
7-Deaza-7-iodo deoxy
Guanosine
Catalog #: **DN-2563**

N-Alkylated Phosphoramidites



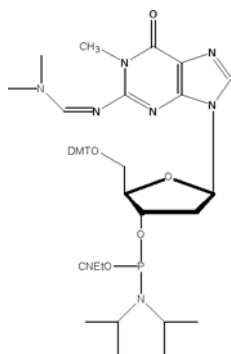
- Due to mutagenic effects of carcinogens, DNA in living organisms is vulnerable to alkylation.
- ChemGenes offers the phosphoramidites for studies of reversal of methylated lesions by use of oligonucleotides incorporating alkylated purine/pyrimidine.
- It has been shown that there is a direct reversal of n-alkylation of methylated bases in oligonucleotides.
- The discovery of an enzyme which is substrate for DNA repair has great implications for repair of such carcinogenic and mutagenic effects. (Ref. 1)

Our featured products include:



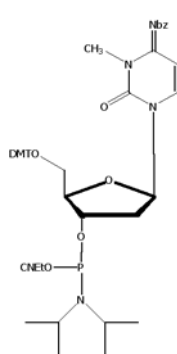
N¹-Methyl deoxy
Adenosine
Phosphoramidite

Catalog # **ANP-6121**



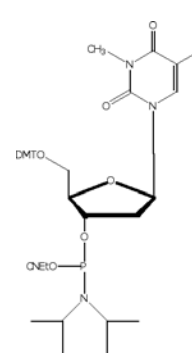
N¹-Methyl deoxy
Guanosine
Phosphoramidite

Catalog # **ANP-6122**



N³-Methyl deoxy
Cytidine
Phosphoramidite

Catalog # **ANP-3851**

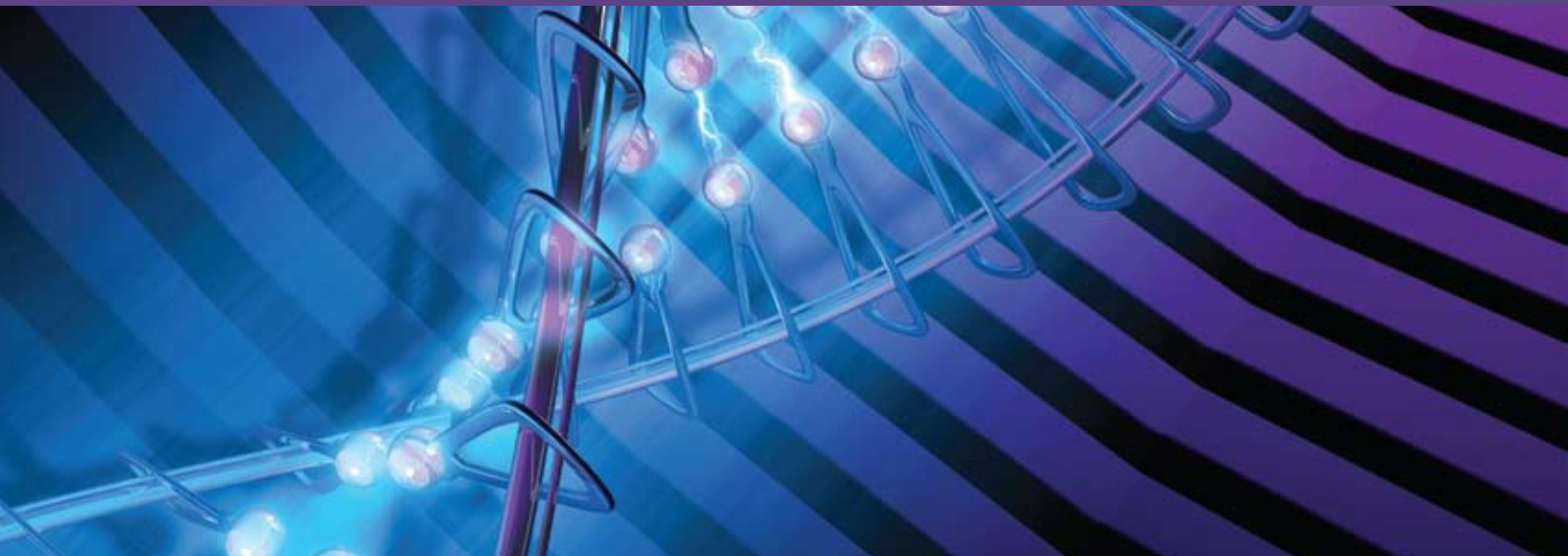


N³-Methyl Thymidine
Phosphoramidite

Catalog # **ANP-6153**

Ref. 1: [S.C. Trewick, T.F. Henshaw, R.P. Hausinger, T. Lindahl and B. Sedgwick, *Nature*, 419, 174-177, 2002; and another report confirming these observations, P. Falnes, R.F. Johansen, E. Seeberg, *Nature* 419, 178, 2002].

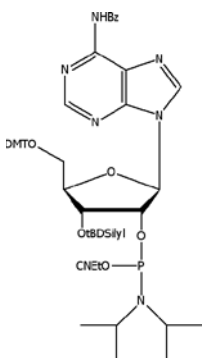
3'-tBDSilyl RNA Phosphoramidites



- Allows the synthesis of 2'-5'-linked oligos.
- RNA 2',5'-duplexes are not substrates of the enzyme RNase. However, they can inhibit the RNaseH mediated cleavage of a natural DNA: RNA substrate.

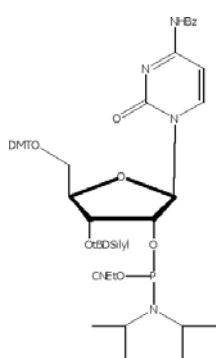
Useful Applications

- Determine their exact biological role.
- Extend their biological half life.
- Alter the biological activity of the core structure.



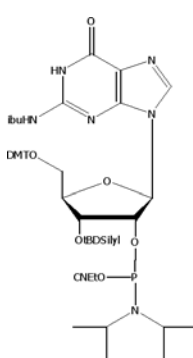
Adenosine (n-bz) 3'-tBDSilyl
CED OP

Catalog #
ANP-5681



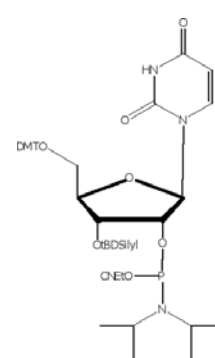
Cytidine (n-bz) 3'-tBDSilyl
CED OP

Catalog #
ANP-5682



Guanosine (n-ibu) 3'-tBDSilyl
CED OP

Catalog #
ANP-5683



Uridine 3'-tBDSilyl
CED OP

Catalog #
ANP-5684

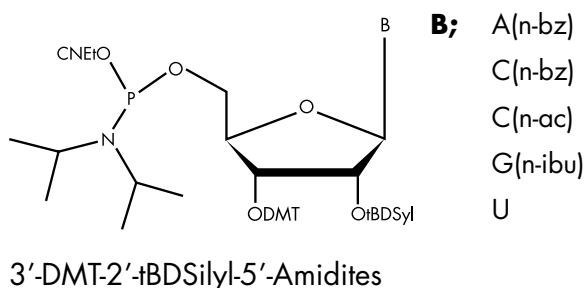
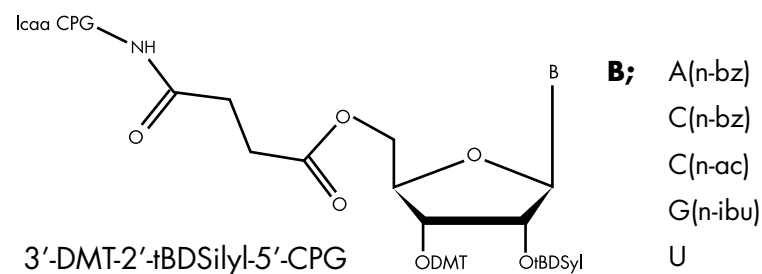
RNA Synthesis – Reverse Direction

Phosphoramidites for Reverse RNA Synthesis:

- **RNA synthesis in 5' to 3'- direction**
- Coupling Efficiency approaching 99% makes this approach highly useful.

Structural Features:

- The reverse RNA monomer phosphoramidites carry a 3'- DMT group, 2'-tBDSilyl (tBDSi) or 2'- triisopropylsiloxymethyl (TOM) and 5'- cyanoethylphosphoramidite (CED) group.



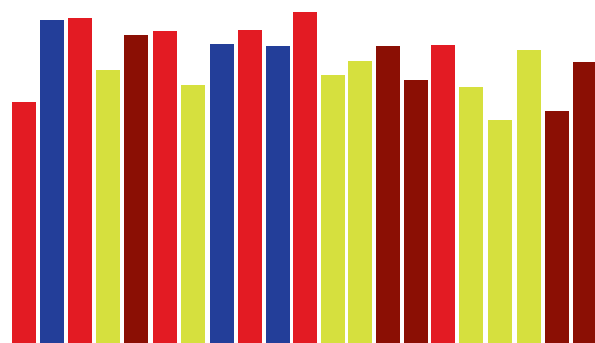
Key Applications:

- Highly efficient synthesis of synthetic RNA in the Reverse direction.
- Application in convenient introduction of Ligands, chromophores and and modifications of Synthetic RNA at the 3'- end.
- Design of Sense Strand of SiRNA & challenging 3'-Modification of RNA

Quality Control:

- HPLC Purity of 98% and greater
- ³¹P NMR purity from 98-100%
- Coupling Efficiency approaches 99% per step.

21- Mer RNA synthesized in 5' to 3' Direction



Average Stepwise Yield: 99.6% Using Sequence Leveling

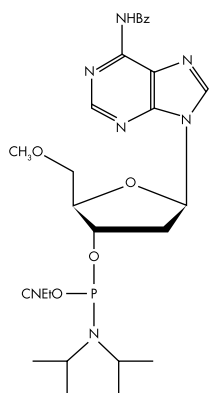
5'-O-Methyl DNA Phosphoramidites



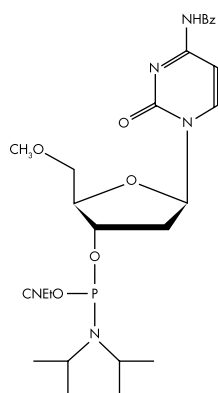
- Chain Terminators for Synthetic DNA using all four amidites.
- All four 5'-O-Methyl-2'-deoxy A,C,G and T-3'-amidites are available for oligo synthesis and incorporating at the 5'-end of oligo.

Quality Control

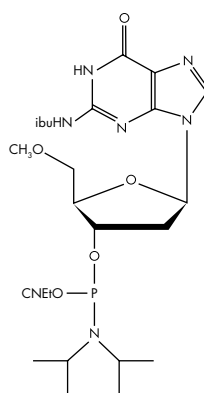
- HPLC purity greater than 98%
- ³¹P NMR purity greater than 98%
- Coupling efficiency greater than 98%



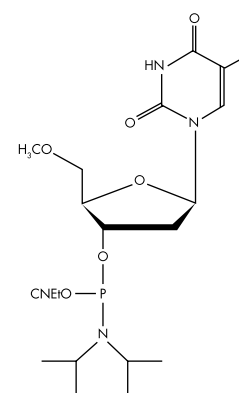
5'-O-Methyl-Adenosine (n-bz)
CED OP
Catalog #:
ANP-5511



5'-O-Methyl-Cytidine (n-bz)
CED OP
Catalog #:
ANP-5512



5'-O-Methyl-Guanosine (n-ibu)
CED OP
Catalog #:
ANP-5513



5'-O-Methyl-Thymidine
CED OP
Catalog #:
ANP-5514

8-Methyl Guanosine Phosphoramidites

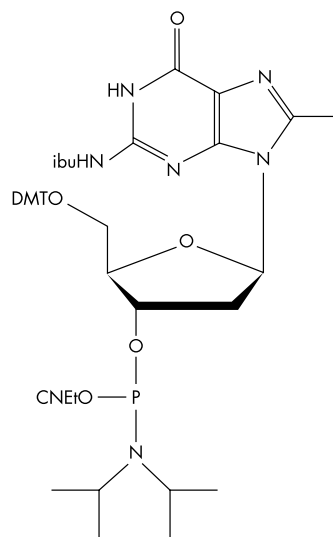


8-Methyl-2'-dGuanosine & 8-Methyl-rGuanosine:

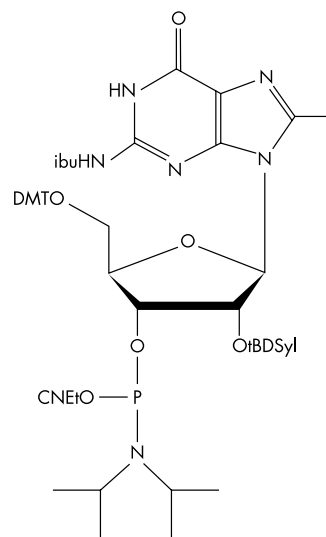
- Powerful Z-DNA stabilizer
- Reading effects B & Z transformation in oligonucleotides
- Can be incorporated into appropriate positions of synthetic DNA

Applications:

- For study of functional role in Gene Expression, transcription control etc.
- Selectivity of Z DNA in protein interactions
- DNA supercoiling modulation
- Selective Targeting of proteins or enzymes
- Aptamer Design and Therapeutic development



8-Methyl deoxy Guanosine
CED OP
Catalog #:
ANP-9274



8-Methyl ribo Guanosine
CED OP
Catalog #:
ANP-6274



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